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DEPARTMENT OF NATURAL RESOURCES
Joseph J. Sommer, Director
DIVISION OF GEOLOGICAL SURVEY
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1984 REPORT ON OHIO MINERAL INDUSTRIES

WITH
DIRECTORIES OF REPORTING
COAL AND INDUSTRIAL MINERAL OPERATORS

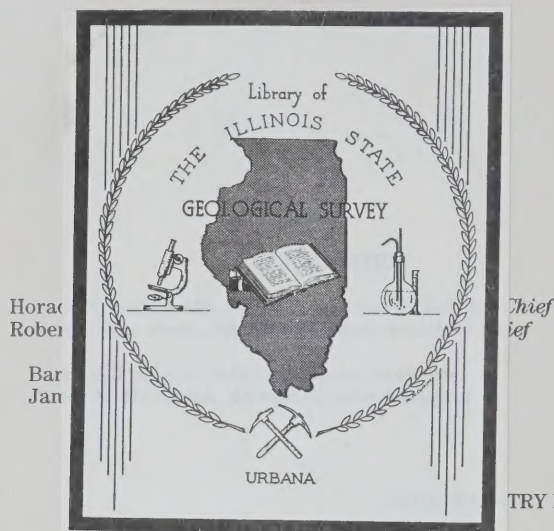
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compiled by
Margaret R. Sneeringer

Columbus
1985




FOREWORD

The 1984 *Report on Ohio mineral industries* incorporates a number of significant changes from the 1983 report. This year for the first time there is an alphabetical directory of industrial-mineral producers; this directory includes sales figures by mine and commodity. Operators' telephone numbers and Division of Reclamation permit numbers for industrial-mineral producers also are listed. Sand and gravel dredged from Lake Erie and the Maumee River are still listed in a separate table, but the figures are now also included in the by-county sand and gravel tables.

The alphabetical directory of coal-mine operators now includes operators' telephone numbers and Division of Reclamation permit numbers. The directory of coal-washing plants has been expanded to include other associated facilities and cleaning methods used. Also new this year are graphs of mineral sales and value as well as geologic and glacial maps of the state and geographic location maps for each commodity.

Some of the changes indicated above were made as a result of comments received from users of the 1983 *Report*. All of the changes were made to increase the usefulness of the report to the public. We continue to solicit comments on how this report can be made to better serve those interested in mineral production in Ohio.

Horace R. Collins
Division Chief and
State Geologist



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THE OHIO ABANDONED MINED LANDS RECLAMATION PROGRAM

by David B. Buchanan
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COAL MINING IN OHIO

The first recorded production of coal in Ohio was in the year 1800. From these early beginnings, when annual state-wide coal production was measured in the hundreds of tons, coal mining in Ohio has grown into a multibillion dollar industry with production rates as high as 55 million tons per year.

Until around World War I, coal mining in Ohio was conducted exclusively underground and largely by manual labor. These underground mining operations gained access to coal seams either by vertical mine shafts of depths up to 200 feet, by horizontal or drift mine entries cut into hillsides at the coal elevation, or by slope entries or tunnels angling downward from the ground surface. The only surface indications of these underground mines visible today are openings or depressions at the sites of mine shafts and entries, openings or depressions marking sites of roof collapse (subsidence), or mine refuse piles at surface exits from the mines.

Early underground mines were small, and often poorly mapped. To maximize coal production, roof support was generally minimal. Further, coal pillars commonly were removed (robbed) upon abandonment of the mines, making the mines highly prone to later subsidence.

With the introduction of large, efficient excavating equipment, new drilling techniques, and newly developed explosives in the mining industry around World War II, large earthmoving operations became possible. Surface or strip-mining operations became an economic alternative to underground mining and now account for two-thirds of Ohio's annual coal production.

In surface mining, all of the overburden—the rock and soil above the desired coal seam—is excavated, exposing the coal seam at the surface. The excavated rock and soil is known as mine spoil and is placed in piles away from the excavation site. Most mine spoil contains iron sulfide minerals, most commonly pyrite. When exposed, the sulfur-bearing material reacts with oxygen and water to form dilute solutions of sulfuric acid, which also contain numerous dissolved metals. This contaminated water, known as acid mine drainage or AMD, is the single most significant problem associated with surface mining.

REGULATION OF SURFACE AND UNDERGROUND MINING IN OHIO

The expansion of surface mining in Ohio around the time of World War II led to an increased public awareness of both surface and underground coal mining, which in turn resulted in legislation which was intended to minimize the environmental effects of that mining. In 1945, the 96th Ohio General Assembly authorized a commission to investigate strip-mine reclamation and to make recommendations the following year for enactment of a strip-mine-reclamation law. This law, the Strip Coal Mining Act, was passed by the 97th General Assembly in June 1947 and required Ohio mine operators to have a state-issued license and to pay a reclamation bond of \$100.00 per acre. A strengthened version of this law, which went into effect in July 1949, created the Division of Reclamation within the Ohio Department of Agriculture.

ment of Agriculture.

Early surface-reclamation requirements enforced by the Division of Reclamation were much less strict than the requirements in force today. Miners were required only to grade mine spoil banks to a gently rolling configuration and to attempt to revegetate the barren spoil. Ponds or lakes could be created to flood the last area excavated by the mining operation. Miners also were provided with the alternative of planting substitute areas rather than their own mine sites if it was felt that the recently exposed mine spoil was too toxic to support vegetation.

The early versions of the surface-mining laws in Ohio have been refined and strengthened numerous times between 1947 and 1981. Gradually, reclamation bonds have been increased and requirements for the success of revegetation and for the restriction of off-site pollution have been tightened. In 1972, a far-reaching revision of the strip-mine law took effect in Ohio requiring regrading of the mine spoil to the approximate premining contour of the land and the establishment of a successful vegetation cover by the mine operator prior to the release of the operator's reclamation bond by the State of Ohio. At the time that this 1972 law was passed, it was the most comprehensive strip-mine law in the nation.

In 1977, the U.S. Congress passed the Surface Mining Control and Reclamation Act (SMCRA). This law was patterned largely after Ohio's 1972 law and provided uniformity of surface-mine-reclamation requirements from state to state. This federal law increased the reclamation and permitting requirements for surface-mining operations in all states and led to the revisions of Ohio law in 1978 and 1981.

The first Ohio law governing the environmental effects of underground coal mining went into effect in August 1949. This law required miners to close or fence all surface openings to those underground mines that were abandoned after June 1941 so as to prevent unauthorized entry into those mines. In 1981, Ohio Substitute House Bill 1051 placed additional requirements on underground-mining operations concerning other surface effects of that mining. This law also required that each underground mine be permitted by the Division of Reclamation and that each mine have a subsidence-control plan to be in effect during and after the mining.

THE PROBLEM OF ABANDONED MINED LANDS

Under the early versions of Ohio's mining laws, surface and underground mining took place without regard for the long-term effects on Ohio's land and water resources or the safety of its citizens. Further, the early surface reclamation laws were based on assumptions about mine-spoil toxicity and water contamination which we now know are not true.

As a result of this early poor planning, a wide variety of problems directly attributable to past mining exists in Ohio's coal-mining region. These problems are known as Abandoned Mined Lands or AML problems and fall into two general categories: public-safety problems and environmental problems. The extent of known public-safety and environmental problems from past mining in Ohio is summarized on page 2.

EXTENT OF ABANDONED MINED LAND PROBLEMS IN OHIO NEEDING RECLAMATION

Mining-related problem	Estimated quantity	Estimated corrective cost	Total cost
<i>Public-safety problems:</i>			
Underground-mine subsidence over residential areas	10,000 acres (?)	\$10,000/acre	\$100,000,000
Underground-mine shafts and entries	1,500 sites	\$10,000/site	\$15,000,000
Stream restoration for flooding control	450 miles	\$10,000/mile	\$4,500,000
Landslides	?	\$25,000/site	\$?
Dangerous structures and equipment	?	\$5,000/site	\$?
<i>Environmental problems:</i>			
Unreclaimed strip-mined land needing major reclamation	210,000 acres ¹	\$8,000/acre	\$1,680,000,000
Unreclaimed mine-refuse piles	7,000 acres	\$10,000/acre	\$70,000,000
Severe mine-drainage problems	1,000 mine systems	\$500,000/system	\$500,000,000
Industrial/recreational site development	1,000 acres	\$10,000/acre	\$10,000,000
		GRAND TOTAL	\$2,379,500,000

¹A total of 450,000 surface acres have been affected by coal mining in Ohio. Of this acreage, it is estimated that 210,000 acres are in need of major reclamation.

Public-safety problems include sites with a high potential for personal injury or property damage. These sites include open mine shafts, mine subsidence, horizontal mine entries, dangerous structures or mining equipment, landslides, flooding from stream sedimentation, and severely polluted mine drainage affecting public water supplies.

Environmental problems include those sites which affect the long-term health of Ohio's citizens or decrease the quality or usefulness of Ohio's land and water resources. Stream pollution, severely eroding land, and disrupted land use or land productivity are examples of environmental problems.

As these problems from past mining became apparent to an increasingly environment-conscious public, later versions of Ohio mining laws and the federal SMCRA of 1977 recognized the AML problem to be an issue separate from the enforcement of current mining laws. It was realized that, in mined areas unlikely to be reaffected by future mining, these AML problems were *not* self-correcting and would require vigorous and costly remedial action.

In anticipation of these corrective projects, the 1972 Ohio mining law levied a 4¢-per-ton coal severance tax to be used for AML reclamation and also created the Ohio Board on Unreclaimed Strip Mined Lands (BUSML) to study Ohio's AML problem. A 1975 revision of the law set up the Unreclaimed Land Special Account to receive the severance-tax funds. In 1977, Substitute House Bill 244 created the AML Section within the Division of Reclamation. This section was made responsible for the identification and correction of AML problems in Ohio using funds approved by the BUSML.

The federal SMCRA of 1977 contained similar provisions for abandoned mined lands. This act levied a 35¢-per-ton severance tax on surface-mined coal and a 15¢-per-ton tax on underground-mined coal. Distribution of the revenues from these taxes for AML reclamation was made the responsibility of the newly formed Office of Surface Mining (OSM) of the U.S. Department of the Interior.

PROJECT ELIGIBILITY

In order for a given problem to be eligible for corrective funding under Ohio's AML program, the project must satisfy several basic requirements. First, the problem must have been caused or accelerated by past mining. In many

cases, such as mine shafts or eroding mine-refuse piles, the relationship to past mining is clearly evident. In some cases, underground-mine maps or post-1948 surface-mine permits may allow the identification of the specific mining operations which initiated the problem.

In many other cases, however, the actual cause of a given problem may be unknown or may not be clearly related to past mining activity. This is particularly the case with sites of subsidence, mass movement, or foundation damage. In questionable cases, a multidisciplinary team of geologists, soil scientists, and engineers from the staff of the Division of Reclamation is assembled to review the problem site and to prepare an objective opinion as to the problem's cause. In a few cases, existing information is insufficient for such a determination and the eligibility of the site for corrective funding is either denied or delayed until additional information is collected, in many cases by exploratory drilling.

State reclamation funds can only be used to correct problems from past *coal* mining. Federal AML funds can be used for problems resulting from either coal or noncoal mining (e.g., limestone, salt, or sand and gravel mines). However, the OSM requires that noncoal reclamation projects be for special cases only because the SMCRA emphasizes coal-related problems. Noncoal project sites must be documented by letters signed by the governor of the state involved outlining the public hazards at the problem site.

A second project-eligibility requirement concerns the dates of the past mining responsible for the AML problem. The bonding and forfeiture provisions of the 1972 state mining law and the 1977 federal law are sufficient to correct any new AML problems created after the dates of enactment of these laws. Consequently, project eligibility under both the state-funded and the federally funded AML programs is limited to mining sites which were abandoned before April 10, 1972, for state-funded projects and before August 3, 1977, for federally funded projects. If the dates of past mining at a given problem site cannot be documented by the AML staff, approval of project funds by the BUSML or OSM is unlikely.

A third factor in project eligibility is the likelihood of future remining. Current laws require mine operators to reclaim their sites upon completion of the mining operations. If a mine operator chooses to reaffected a previously mined area, the same strict reclamation requirements will

apply upon completion of the remining. Consequently, if an existing AML problem site is likely to be reaffected by future mining, the AML problem will almost certainly be corrected during reclamation of the remining operation without the use of state or federal AML funds. Thus, AML staff members must consider the extent of remaining coal reserves at the problem site and the proximity of current mining operations which might later reffect the site. If remining is likely, eligibility of the problem site will be denied.

A fourth and final eligibility requirement for each problem site is the lack of any continuing responsibility for the reclamation of that site by any other individual, company, or agency. A written statement must be filed by the AML staff for each proposed site indicating that all applicable reclamation bond has been released by the Division and that no legal action is pending which might force some other party to reclaim the problem site.

PROJECT PRIORITY

Fulfillment of the four project-eligibility requirements does not guarantee the funding of corrective reclamation at a particular problem site. The number of known, eligible AML problems in Ohio far exceeds the corrective capability of Ohio's AML reclamation program. Each eligible problem site is therefore also examined in terms of the urgency of the need for reclamation and the severity of the existing problems.

The funding decisions of the BUSML regarding a particular proposed project site depend on a variety of factors. Among these factors are the size and scope of the proposed work, the severity of the AML problems at the site in comparison with other sites statewide, the degree to which the project work will benefit local residents or communities, and the project costs.

The SMCRA is much more specific about the priority of reclamation projects to be undertaken with federal AML funds, and this ranking is strictly enforced by the OSM in the approval of individual projects. Federal AML project priorities as ranked in Section 403 of the SMCRA are:

1. Protection of the public from extreme dangers having an immediate and direct threat to the safety of the public;
2. Protection of the public from adverse effects of past mining;
3. Restoration of land and water resources and the environment;
4. Research and development projects;
5. Protection or enhancement of public facilities;
6. Development of publicly owned land.

Any project site proposed for reclamation using federal AML funds will be classified by the Division and by OSM into one of these six categories. The more highly ranked projects will be funded first.

OHIO'S AML PROGRAM

The AML Section of the Division of Reclamation, Ohio Department of Natural Resources currently operates three individual programs dealing with AML problems in Ohio: the bond-forfeiture program, the state-funded program, and the federally funded program. These three programs operate independently because of differences in the priorities and procedures associated with the three different funding sources available to the AML Section.

Bond-forfeiture program

The oldest AML program within the Division of Reclamation is the bond-forfeiture reclamation program. This program began in 1948 with the forfeiture of reclamation bonds for 38 mining licenses issued under the newly created

strip-mine law of the previous year. Since 1948, bonding and forfeiture provisions have been strengthened several times, notably with the 1972 and 1977 mining laws.

Reclamation bonds are funds deposited in accounts by every mine operator prior to the start of mining. If the mine operator fails to adequately reclaim the mine site upon completion of the operation, either through bankruptcy or negligence, this bond is turned over or forfeited to the State of Ohio. The Division of Reclamation, acting as the State's agent, uses these forfeited funds to complete the reclamation of the mined site to the extent that the forfeited funds will allow.

The depressed coal market in Ohio and the imposition of stricter reclamation requirements beginning in the late 1970's led to a significant increase in the number of bond forfeitures. Between 1980 and 1983, over 80 coal permits were forfeited. In 1983 alone, \$1,866,000 in forfeited bond was received by the Division. The AML forfeiture program uses these funds to design, construct, and inspect the reclamation of forfeited permit areas.

State-funded AML program

The 4¢-per-ton state severance tax levied in Ohio since 1972 is collected by the State Treasurer's office and placed in the State's Unreclaimed Land Special Account. At first, these funds could only be used for reclamation of publicly owned land, with the State Controlling Board exercising the authority to dispense the funds. However, in 1977 the authority to use these funds was transferred to the BUSML, a board at first charged only with identifying and quantifying the AML problem in Ohio and proposing a program of reclamation. The BUSML was also given the expanded authority to conduct reclamation of privately owned land.

By law, up to 20 percent of the state severance taxes annually credited to the Unreclaimed Lands Special Account may be used to administer the state-funded AML program. In addition to funding the BUSML, these administrative funds support several full-time staff members of the AML Section. These staff members investigate citizen complaints, identify and document AML problems throughout the state, propose reclamation projects to the BUSML, and administer the design and construction of projects approved by the BUSML.

The BUSML may approve reclamation funds for feasibility or preliminary investigation studies, preparation of construction plans and specifications, project construction, and construction inspection. Project sites proposed to the BUSML by the AML staff of the Division of Reclamation may be approved, approved in part, or disapproved by the BUSML.

The BUSML established the project priorities of the state-funded AML program with the *Land Reborn* study of 1974. This study was the first systematic attempt to quantify the surface acreage affected by past mining in Ohio and the number of miles of Ohio streams affected by chemical contamination from mining. Further, the *Land Reborn* study attempted to analyze the social and economic effects of these AML problems on Ohio's coal-mining region.

The state-funded AML program has maintained the Board's interest in land and water pollution and in the economic effects of AML areas. State-funded reclamation projects emphasize the correction of severe erosion, the restoration of productive land use, and the correction of mining-related water pollution.

In 1979, the state-funded AML program was also given the authority to provide grants to local political subdivisions for the reclamation of mined sites for the purposes of commercial, industrial, or recreational site development. Up to 20 percent of the money credited to the Unreclaimed Lands Special Account in any given calendar year may be used on these types of projects, which are intended to assist

communities economically disadvantaged by past mining.

As an alternative to competitive bidding on construction projects, reclamation projects authorized by the BUSML may be accomplished through cost-share grants to the landowner of the problem site or to operators of active coal mines adjacent to the problem site. These contractual alternatives can result in significantly lower reclamation cost.

Federally funded AML program

The passage by the U.S. Congress of the SMCRA in 1977 made Ohio's federally funded AML program possible. This act provides the funds, administrative framework, and project-selection criteria for federally supported reclamation projects. The federal AML program is closely monitored by the OSM to insure its compliance with the requirements of the federal law.

The State of Ohio, as represented by the Division of Reclamation, did not automatically become eligible to receive federal reclamation funds generated by the 35¢-per-ton severance tax. The Division first had to demonstrate its ability to administer both the enforcement of current surface-mining laws and a separate AML program. This demonstration was achieved in 1982 with the submission to and approval by the OSM of Ohio's permanent program for enforcement of federal and state mining laws and the State Reclamation Plan for Ohio. This latter document is a comprehensive summary of the extent of existing AML problems in Ohio, the specific procedures to be used by the Division in administering federal AML funds, and the expected benefits in Ohio from the operation of the AML program.

With the approval of the State Reclamation Plan in 1982, Ohio became eligible to submit annual grant requests to the OSM for the support of the federal AML staff and for the funding of design, construction, and inspection work on reclamation projects. These annual grants, known as work plans, contain funds for up to 80 individual reclamation projects, totalling 10 to 15 million dollars per grant.

The process by which annual work-plan grants are prepared, submitted, and approved is similar to project-approval methods used by the BUSML. As with state-funded projects, federally supported reclamation projects generally originate from investigations of citizen complaints by the AML staff. Documentation of the extent of the problem is compiled by the AML staff on standard forms issued by the OSM. A preferred reclamation alternative and cost estimate for the correction of the particular problem at the site are then developed by the engineering staff of the Division. Finally, an environmental assessment of the detrimental effects of the project construction is prepared and clearance for the construction is obtained from the Ohio Historic Preservation Office.

The combined standard forms, project budget, environmental assessment, and historical clearance for each proposed project constitute the grant request submitted to the OSM. The OSM may then approve or disapprove any or all of the projects submitted in the work plan. Upon receipt of the approved grant from the OSM, design work is begun by the Division's Engineering Section or by design consultants hired by the Division. When a project's final design is complete, construction bids are accepted by the Division

from private construction firms based on that design and a contract is issued to conduct the actual reclamation at the project site.

PROGRAM ACCOMPLISHMENTS

Construction projects which have been completed by the three sections of Ohio's AML program are summarized below.

All three reclamation programs are still in operation, but reduction in state severance-tax revenues available to the BUSML have severely decreased the number of state-funded projects now in planning for future construction. With time, more and more of the reclamation funds approved by the BUSML will probably be directed toward less expensive landowner cost-share grants or mine-operator contracts.

Since 1982, federal severance-tax revenues available to the AML Section have grown rapidly and now total 10 to 15 million dollars annually. Very soon, this funding increase will be visible in a dramatic rise in the total figures for completed, federally supported reclamation projects as those construction projects now underway or in design are completed.

Unless extended by the U.S. Congress, the collection of federal severance taxes as authorized by the SMCRA of 1977 will cease in 1992. By that time, it is anticipated that around 180 million dollars will be made available to the State of Ohio for AML reclamation. This amount will allow for the correction of only the worst 5 to 10 percent of the AML problems in Ohio.

State and local governments, private organizations, and individual citizens can therefore play an important role by supporting Ohio's AML program. With this support, the likelihood of a continuation of federal and state funding of AML reclamation in Ohio can be increased and the Division of Reclamation will be able to continue its efforts to safeguard Ohio's citizens and to improve the state's land and water resources.

SUMMARY OF COMPLETED AML RECLAMATION PROJECTS, JANUARY 1985

Project type	Number of projects	Quantity/ acres	Reclamation cost to State
<i>Bond-Forfeiture Program</i>			
Strip-mine reclamation	41	859 acres	\$2,882,220
<i>State AML Program</i>			
Strip-mine reclamation	27	1,416 acres	\$7,361,027
Mine-refuse piles	5	98 acres	685,700
Mine-drainage control	3	not applicable	38,847
Mine seals	2	not applicable	551,048
Total:	37		\$8,636,622
<i>Federal AML Program</i>			
Strip-mine reclamation	7	589 acres	\$5,948,915
Mine-refuse piles	1	10 acres	334,367
Mine-drainage control	4	not applicable	1,948,790
Landslides	10	27 acres	837,525
Mine shafts	13	33 shafts	839,078
Mine subsidence	8	9 acres	89,746
Total:	43		\$9,998,421
GRAND TOTAL FOR ALL PROGRAMS:			\$21,517,263

DOLOMITE IN GLASS MANUFACTURE

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Although dolomite deposits are found in numerous locations throughout the United States, there are only about a half dozen or so which are sufficiently pure and consistent in their chemical composition that they are sought as sources of glass-batch dolomite. These deposits are located in Virginia, Tennessee, Pennsylvania, Indiana, Oklahoma, California, and Ohio. The deposits in northwest Ohio are widely recognized as among the most pure in the world and commonly are used as the primary sources of lime in commercial glass batches. The chemical-grade dolomite being mined in northwest Ohio contains at least 54 percent calcium carbonate and 45 percent magnesium carbonate. Other mineral compounds total less than 1 percent. This massive and bedded deposit is part of the Silurian-age Guelph Dolomite and is at least 300 feet thick. The dolomite is light grey to light tan and medium to coarse grained.

GEOLOGY OF DOLOMITE

To examine the origin of this particular Ohio dolomite, we must travel back in geologic time some 400 million years, past several ice ages and before the time of dinosaurs, to the Silurian Period of the Paleozoic Era. Imagine that what is now the Great Lakes region was covered by a shallow, tropical, salt-water sea abundant in plant and animal life—particularly animals such as bryozoans, a type of reef builder, and crinoids, also known as sea lilies. Both these types of animals have exoskeletons made of calcium carbonate. The skeletal remains of these creatures were the beginnings of a limestone deposit.

But limestone is composed of the mineral calcite, which is calcium carbonate, and dolomite (the same term is used for both the rock and the mineral) is the double carbonate of calcium and magnesium. How was the limestone changed to dolomite? Apparently, water solutions high in magnesium permeated this limestone deposit for millions of years, and magnesium ions, being smaller than calcium ions, simply replaced some of the calcium to form a chemically more stable mineral, dolomite, in a process called dolomitization. In some limestone deposits dolomitization is only partially completed; these deposits are sources of magnesian limestone. When dolomitization is complete, every other calcium ion in the calcite crystals has been replaced by a magnesium ion, resulting in the rock dolomite.

DOLOMITE PRODUCTION AND CONTROL

The quarrying operation is an important step in the final product. The composition of all materials such as explosives, refractories, and welding rods must be considered in operating and maintaining production and handling equipment in order to avoid inadvertently contaminating the product with materials detrimental to glass manufacturing. The glass-batch-dolomite producer must maintain a chemical laboratory equipped to conduct instrumental analyses to verify the integrity of the product.

Dolomite for the glass industry is dried, generally in a fluidized-bed stone dryer, to lower the moisture content to 0.05 percent or less. The dried stone is then processed into various sizes. Some of the dolomite may be sent to a lime plant, where the stone is calcined in kilns at 2,200° Fahrenheit

to chemically convert it into dolomitic quicklime. Throughout the production process, the chemical and physical properties of the chemical-grade dolomitic stone and lime must be compared with customer specifications.

DOLOMITE IN GLASS MANUFACTURING

Float-glass, insulating-glass-fiber, and specialty-glass manufacturers depend heavily on dolomite in their products. Dolomite furnishes magnesia, which in proper proportion lessens the tendency toward devitrification; inhibits chemical attack by atmospheric gases and moisture; lowers the setting rate of the glass, thus improving its workability; increases resistance to fracture by thermal shock; and provides some additional fluxing action. Also, research has shown that the amount of soda ash required can be reduced by increasing the amount of dolomite used in the batch.

The consistently low iron content of glass-batch dolomite not only helps the glass technologist maintain proper glass color, but also helps the furnace superintendent maintain predictable infrared transmittance and hence consistent thermal efficiency in melting the glass. In addition, dolomitic raw materials in the batch promote a lower liquidus temperature because of the synergistic effect of using two alkaline earth oxides (calcium and magnesium) as opposed to just one (calcium).

For operations that use quicklime, dolomitic quicklime is preferable to calcitic quicklime because dolomitic quicklime is chemically more stable than calcitic quicklime; that is, dolomitic quicklime reacts more slowly with moisture and carbon dioxide in the atmosphere. Thus dolomitic quicklime can be handled and stored with less chance of chemical degradation. In terms of health and safety practices, the slower reaction of dolomitic quicklime with moisture means it is less irritating to sensitive body tissues.

The float-glass industry, which produces sheet glass by floating the glass on molten tin, uses large quantities of dried granular dolomite. In addition to the reasons cited earlier, the magnesia provided by dolomite may inhibit reaction between the molten tin and the glass. It is also felt that carbon dioxide evolved in the furnace during calcination of dolomite helps mix the melting glass, thus speeding the fining of the glass.

Glass manufacturers report that dolomite is one of their least expensive raw materials. It is not surprising, then, that there has been a dramatic increase in the amount of dolomite purchased by the float-glass industry since its inception. In fact, when the float-glass process was new, generally only half as much dolomite as calcite was used. Presently, nearly 2½ times more dolomite than calcite is used.

While the use of dolomite was increasing in float-glass and glass-fiber production, the container-glass industry, an historically massive consumer of dolomite, was for the most part replacing dolomite in their batch with high-calcium materials. Why did this happen when all the advantages attributable to dolomite are important for glass-container manufacture?

The one-way, nonreturnable glass container does not need the high resistance to chemical attack and to fracture

TYPICAL CHEMICAL ANALYSIS FOR DOLOMITIC GLASS STONE

General formula $\text{CaMg}(\text{CO}_3)_2$	
Silica (SiO_2)	0.35 percent
Iron oxide (Fe_2O_3)	0.07 percent
Alumina (Al_2O_3)	0.11 percent
Calcium carbonate (CaCO_3)	54.06 percent
Magnesium carbonate (MgCO_3)	45.24 percent
Sulfur (as SO_3)	0.09 percent
Free moisture (H_2O)	0.05 percent
Other	0.03 percent

TYPICAL CHEMICAL ANALYSIS FOR DOLOMITIC GLASS LIME

	Quicklime (CaOMgO) percent	Normal hydrate ($\text{Ca}(\text{OH})_2\text{MgO}$) percent
Silica (SiO_2)	0.90	0.76
Iron oxide (Fe_2O_3)	0.18	0.15
Alumina (Al_2O_3)	0.60	0.51
Calcium oxide (CaO)	57.10	48.23
Magnesium oxide (MgO)	39.20	33.11
Sulfur (as SO_3)	0.25	0.21
Loss on ignition	1.74	17.00 ¹
Other	0.03	0.03

¹17.00 percent loss on ignition includes 15.2 percent combined water and 0.40 percent free moisture.

due to thermal shock required in containers that are returned, cleaned, and reused. Clearly, the durability associated with dolomite in container glass is not an important factor in one-way-container batch. Also, new bottle-forming machines require a fast-setting glass rather than slower setting magnesia-bearing glass. This may have been another significant reason for phasing dolomite out of the glass-container batch.

ENERGY SAVINGS AS A CRITICAL FACTOR

Today, dolomitic quicklime is particularly popular in insulating-glass-fiber batch. One reason for its popularity is that use of dolomitic quicklime instead of dried granular stone affords the glass manufacturer considerable energy savings and, as a result, overall lower glass-production cost, primarily because a coal-fired lime kiln is more energy efficient and cost effective in calcining lime than is a gas-fired glass furnace. The increasing costs for natural gas will make the economics of using quicklime even more favorable in the future.

Glass manufacturers are continuing to work to reduce energy consumption. Dolomitic quicklime can help because it promotes faster batch melting. In addition, the glass manufacturer can save approximately 3.75 million Btus of heat energy for each ton of dried stone replaced by dolomitic quicklime.

The use of totally electric glass furnaces may become a popular technique for controlling glass-melting costs. Raw materials which degas during the batch melting can cause problems in this type of furnace because the gas may not be easily vented from the furnace. For this reason, dolomitic quicklime is preferable to dried stone in an electric furnace.

Batch consolidation is another technique for reducing energy consumption because waste heat from the furnace can be saved by preheating the briquetted or pelletized batch. Batch consolidation also helps control dusting, therefore permitting the use of finer sized raw materials, enabling faster batch melting. We anticipate that batch consolidation will become popular. This is good news for the industry, as research has demonstrated that dolomitic quicklime is an excellent binder for consolidated batch.

If new melting or fabrication techniques are developed

that require magnesia-bearing glass, or if more durable glass products are required in the future, demand for glass-batch dolomite will increase because it is an inexpensive source of magnesia. Overall, it appears that the glass industry will show increased demand for all dolomitic raw materials because of not only an anticipated strong market for float-glass and glass-fiber products, but also an anticipated increase in the percentage of dolomite in the batch.

OUTSIDE INFLUENCES ON DOLOMITE

An important question to the industry is what the container of the future will be. Will it be glass, steel, aluminum, or plastic? The glass-batch dolomite business will be greatly affected if glass is not the container of the future. And if glass is the container—what type of glass will it be? The returnable bottle requires the durability provided by magnesia. Therefore, container-industry usage of dolomite will be affected by the type of bottle produced.

Another area which will greatly affect the dolomite business is that of regulations. Although the EPA receives most of the media attention, other federal and state agencies have a great impact on the dolomite producer. The Mine Safety and Health Administration and state reclamation laws have certainly affected and will continue to affect the manner in which quarries are operated and dolomite is produced.

Another factor which will continue to have a great effect on all industry is transportation. With the passage of the Motor Carrier Act and the Staggers Rail Act in 1980, both shippers and carriers entered the dawn of a new day. Federal government policy is promoting and encouraging greater competition within and between the several modes of transportation. Initially the motor-carrier industry showed more innovation in new rate techniques than did the railroad industry, but this situation is changing as the rail carriers feel more comfortable with the freedom to establish rates and provide service tailored to particular industries. The basis for establishing rates is becoming more cost oriented, and knowledge of carrier costs is important to shippers and receivers in negotiating with carriers. The Staggers Rail Act is benefiting producers

served by multiple railroads, resulting in mutual benefits to the receiver, carrier, and shipper.

We will see increased use of motor-carrier transportation for distances up to 500 miles. Some of this increased motor transportation will be in trucks that can be utilized for multiple purposes. Presently, several glass companies are hauling dolomite in trucks which are also used for hauling glass.

For the past several decades we have seen a westward movement in this country that was greater than any since the homesteading period of a century past. But the tide is shifting; the Sun Belt is now experiencing the same problems with pollution, crime, and high taxes as the Northeast. In addition, better water availability in the Great Lakes area is causing a shift in the location of glass plants and raw-material sources used. Whereas in recent years glass-industry expansion has occurred mainly in the Sun Belt, we are now seeing an increased emphasis on improving and expanding glass production in the Great Lakes area. The result will be more glass production closer to the major dolomite-producing region, thereby reducing the transportation cost and increasing the use of Ohio dolomite as a batch raw material.

DOLOMITE PRODUCER CHANGES IN THE 1980'S AND 1990'S

Dolomite producers also will make important changes. The use of coal for lime calcination will continue, and pulverized coal will probably be the fuel used in the drying of dolomite. It is also quite possible we will use exhaust heat from lime plants to dry stone. We may eventually see our calcination done electrically. The carbon dioxide driven off will be captured and sold for a price probably greater than the price of the lime produced.

The glass industry will probably demand more finely sized batch materials to achieve greater energy efficiency. The dolomite producer will be able to furnish the finer

materials; however, it will probably be in a pelletized form. We have studied this possibility and know pellets can be produced which will not degrade in shipping and handling. The pelletized dolomite will provide the glass plant with a product that will go into solution quickly and not create handling and dusting problems.

Calcined lime also will be in a pelletized or briquetted form. The pellets or briquets possibly will be a mixture of lime and other glass-batch ingredients. Furnishing lime in this form will certainly eliminate many of the environmental and safety problems associated with using lime fines.

All of the foregoing changes will help to hold down the escalating price of dolomite. However, there are some other factors which will at least partially offset these production efficiencies. Unquestionably, the actual number of producers of stone products for both chemical and construction use will continue to decrease. The reason for the closings and lack of new facilities is basically one of low profit margins. The cost of regulations are certainly contributing to the closings and lack of additional investment in our industry. The problem of zoning will continue to remove needed reserves of quality chemical-grade minerals from production until the federal government enacts a land-use bill recognizing the need for all minerals, including dolomite.

CONCLUSION

This versatile rock called dolomite will be increasingly used as a raw material by the steel industry, as a desulfurization agent in coal burning, and as an industrial filler. There will also be augmented demand for glass-batch dolomite because of expanded float-glass and glass-fiber production. This strong demand, occurring simultaneously with a reduction in the number of dolomite producers, signals a healthy business climate for the dolomite industry in the 1990's.

THE VALUATION OF MINERAL RESERVES

by
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Ohio is blessed with abundant deposits of valuable mineral resources such as coal, salt, clay, limestone, and sand and gravel. These resources, however, are finite, and they are being depleted at a rapid rate—not only by mining but also indirectly by regulatory controls and land-use competition. Because new deposits are not being created, those which remain are becoming more and more valuable. Paradoxically, they are often more difficult to extract, are of poorer quality, and are located farther from the point of ultimate use than the deposits that have been exploited in the past.

In addition to facing a scarcity of raw materials, Ohio's mining industry has recently been experiencing severe pressures in the marketplace. The problems are due primarily to external, noncontrollable factors such as the recent national economic recession that forced a decline in aggregate sales; the enactment of the Clean Air Act, which drastically reduced the consumption of high-sulfur bituminous coal; and the change in character and the decline of the U.S. steel industry that decimated the production of metallurgical and refractory limestone and lime. These pressures have resulted in increased competition among the state's mining companies and an acute awareness of costs—including the cost of mineral-deposit acquisition—that was not apparent a decade ago. Numerous companies have been forced into the money market to solve cash-flow and capital-acquisition problems resulting from the current economic squeeze.

All the above circumstances, along with the growing tendency of taxing authorities to view mineral resources as a source of revenue, have tended to generate increased activity in the field of mineral-reserve¹ valuation. Although circumstances under which mineral appraisals have been conducted often have negative connotations (such as cash-flow problems and tax evaluation), benefits derived from these appraisals are by and large positive and serve in many ways to assist in the preservation and optimal utilization of Ohio's valuable mineral resources.

THE CONCEPT OF VALUE

Value is an elusive word that is extremely difficult to define in a general sense. Everyone knows what it is, yet few are able to frame an adequate word picture. The problem stems from the fact that value is a concept—a perception—and has different meanings depending on one's perspective. Webster defines value, in a business sense, as "the material worth of a thing . . . as estimated or assigned in terms of a medium of exchange." Paraphrasing the Ohio Department of Taxation and similar taxing authorities, value is "the fair price at which property should or did change hands on the open market between a willing buyer and a willing seller, neither being under any compulsion to buy or sell and both having a knowledge of all the relevant facts." Texts on investment analysis and engineering economy describe value as "the present worth of a future income stream, discounted at an appropriate capitalization rate and adjusted for the effects of inflation."

¹Editor's note: the terms "resource" and "reserve" as used in this article are not necessarily consistent with those used by the Division of Geological Survey.

The fact of the matter is that all the above definitions, and many others to be found in the literature, are correct under certain circumstances. All of them, however, contain vague words such as estimated, fair, and appropriate which tend to confuse not only the general public but also experts in the field.

The value of a mineral reserve to an appraiser would be defined as "the worth in money at a given point in time to an interested party of all the minerals that will ultimately be extracted and sold from the deposit." Although this definition may lack perfection, it is succinct, it applies to all conceivable mineral-valuation situations, and it brings out a number of important points about the concept of value as it applies to mineral reserves:

1. Value is extremely sensitive to time. An accurate value today may lose all significance in a relatively short period of time because of such factors as technological changes, economic reversals, and new discoveries.
2. Different parties to a mineral-deposit transaction or negotiation may legitimately arrive at value figures which are very far apart. A fair market value may have little relevance to parties constrained by their own economic situations. It is not at all guaranteed that a common ground exists between two opposing positions.
3. The mineral appraiser is interested only in that portion of the deposit that will ultimately be sold. All the rest is utterly worthless and never enters into any valuation calculations.

WHY APPRAISE MINERALS?

There are numerous reasons for wanting to ascertain the value of a mineral resource, but the most common ones involve transferring rights (buying, selling, leasing, or appropriating), borrowing or raising money to finance or refinance a business venture, or taxing. When mineral interests are transferred, both the grantor and the grantee need to know the value of what is changing hands. Such transactions are always opposing relationships, and the party having the best information will enter the negotiations in the superior position.

In the most common case, the party giving up the rights is a private citizen, and the party gaining the rights is a mining company which intends to extract and sell the mineral deposit. The private citizen is often ill-informed about what he is negotiating for and its value and has only a limited number of economic alternatives. He is also reluctant to seek professional assistance, even though the cost involved may represent a very small percentage of his potential gain. The mining company, on the other hand, although somewhat better informed than the seller, is still in many cases woefully ignorant about the reserve itself, whether or not it is really needed, and its impact on future profits. Competent managers sometimes make almost capricious decisions regarding mineral-deposit acquisitions amounting to tens or hundreds of thousands of dollars based on less information than they would require for the purchase of some small capital asset. Many mining companies have rules of thumb which they use to guide them in

their mineral transactions. For example, "deep coal is worth 'x' cents per ton in the ground," or "a fair sand and gravel royalty is 'y' cents per ton across the scales." In some cases these estimates might have had some historical basis in fact, but they seldom, if ever, have any current economic relevance as far as the value of a mineral deposit is concerned.

The second major reason for requiring the valuation of a mineral reserve is that the reserve is to be used as collateral for a loan or some sort of financial promotion. In this case the borrower is usually an individual or a business that is operating or intending to operate a mining concern, and the lender is either a commercial lending institution or a venture capitalist. Again, both parties need an independent appraisal of the reserves. The borrower must be aware of the values involved so he can be realistic about the size of the loan and his ability to pay it back with interest. The lender must not only consider the borrower's ability to pay back the loan but also the ramifications of default, that is, what will the reserves bring on the open market and what kind of income will be produced if the lender (now the owner) decides to run the operation as a business. As in many cases where mineral rights are transferred, both the lender and the borrower negotiate and execute loan agreements based on extremely limited knowledge. It is not uncommon for either or both parties to misjudge by an order of magnitude or more the value of the mineral reserve used as collateral. The lender and the borrower may form a cooperative relationship, and, upon occasion, the appraiser may simultaneously provide service to both parties to the agreement.

The third and final reason for requiring mineral-reserve valuation is for purposes of taxation. Mineral reserves are defined as real property in Ohio and are thus subject to ad valorem real-estate taxes as outlined in Chapter 5713 of the Ohio Revised Code. The valuation or assessment of such real property is statutorily placed in the hands of each of Ohio's 88 county auditors.

When the entire fee simple estate² is owned by one party, the mineral interests and the surface are valued together, and the owner is subject to one combined tax. If, however, the mineral rights and the surface rights have been separated by a conveyance and are owned by different parties, each must be valued and taxed separately on an annual basis.

As in the case of transferring mineral rights, the taxation of mineral interests creates opposing viewpoints—this time between the taxing authority (county auditor) and the owner of the mineral resources (usually a private individual or a mining company). The auditor perceives the mineral reserve as a potential source of revenue and tends toward the maximum valuation, which in turn yields the maximum tax. The owner, on the other hand, views taxation at best as an unwanted expense and tends to undervalue the mineral deposit. The tax, in fact it is assessed at all, may have no relationship to the value of the mineral reserve; moreover, the owner often has no idea whether the tax is exorbitant, nominal, or equitable.

As in the previous examples, both parties need to know the value of the mineral deposit being taxed. The auditor is required by law to value mineral reserves in his county and generally does so with the assistance of a paid professional appraiser selected from a file maintained by the Ohio Department of Taxation. Conversely, the owner of the minerals may feel that his tax assessment is unrealistic or unfair, and may want his own valuation in order to contest his tax bill before a county Board of Revision, a Common Pleas Court, or the State Board of Tax Appeal.

The primary role of the appraiser in all of these examples is to determine value; but value, as stated earlier, takes many forms. In many cases a client will ask "What is this deposit worth?" when he really means "What is the maximum amount I can afford to pay for this deposit, based on its income-producing ability, my own financial situation, and my other investment opportunities?" or "What is the minimum amount I can afford to sell this deposit for?", based on the same criteria. The point here is that there are two basic types of value questions: "What is it worth in the marketplace?" and "What is it worth to me?" These questions are different and not always reconcilable. Mineral-reserve valuation often entails the investigation of these and similar value-related questions.

VALUATION TECHNIQUES

The basic valuation or appraisal techniques are well defined and documented and are applicable, to a greater or lesser degree, to all forms of real property—including mineral reserves. These techniques are known as the cost approach, the market or sales approach, and the income approach. In theory all three techniques applied with the proper adjustments to the same asset will generate exactly the same value figure. In practice, however, the results are generally quite different; this observation is particularly valid when dealing with an asset so ill-defined as an unseen mineral deposit.

In the cost approach, the value of an asset is expressed as its purchase price plus improvements, less deterioration, with all factors adjusted for economic growth or decline. Although it is very important to the appraisal field in general, the cost approach is seldom used in mineral-reserve valuation; this technique is much more applicable to the valuation of buildings and equipment than to the appraisal of mineral reserves. Even similar deposits may show large variations in factors such as development cost and depletion, and these variations tend to seriously weaken the validity of the technique.

In the market or sales approach, the value of real property is estimated on the basis of recent offers to sell, offers to buy, and actual sales of comparable property in the market area, after allowances are made for variations in features and conditions. These comparable sales are normally defined as the price settled between a willing buyer and unrelated willing seller, both of whom have full knowledge of the market conditions and potential uses of the property and are uninfluenced by any type of economic duress. Such sales also are known as arm's-length sales.

The market approach has great statistical validity when large numbers of transactions are involved (as in the sales of single-family dwellings) and is the technique preferred by local, state, and federal courts and taxing authorities. Even if a different approach is finally accepted, it normally must be shown that a market approach was attempted and rejected for valid reasons.

Although there is no doubt that the actual sale of an asset in the open marketplace is the ultimate test of worth, the use of the market approach in valuing mineral reserves presents the appraiser with a number of unique and challenging problems because of the scarcity of timely transactions, the difficulty in determining sales prices, the unlikelihood of any transaction meeting all the comparable-sales criteria, and the inherent dissimilarity of mineral deposits.

In the income approach, the cash-income-producing ability of a real-property asset is projected throughout its anticipated life. In the case of a nondepreciable asset such as farmland the life is assumed to be perpetual, but in the case of a mineral deposit the life is finite and tied directly to the available reserves. The anticipated future cash flow is discounted to the present at a suitable rate of interest, and

²For the purposes of this article a fee simple estate may be defined as total property ownership, that is, ownership of the surface and all that is upon it, all the minerals, and all the rights pertaining to the extraction of the minerals.

the figure thus obtained represents the value of the asset. The general procedure is called cash-flow discounting and is based on the concept that money has a value which is related to time—that is, the promise of a dollar to be paid at some time in the future, even in the absence of risk, is worth less than a dollar today.

This technique works very well when applied to income-producing property such as mineral reserves, and it is particularly powerful when those reserves can be tied to or associated with a prospective or an active mining operation. It is also equally applicable to working or royalty interests. The income approach is preferred by almost all mining companies, lending institutions, and venture capitalists who are actually involved in buying, selling, and financing mining operations, and it is commonly used by professional appraisers and investment analysts in the field.

In evaluating a mineral reserve, the appraiser normally uses the market or the income approach or a combination of both. For example, in valuing a small, isolated, mineral deposit owned by a private individual, located many miles from any active mining area, and containing unproven minerals, the market technique would be the obvious choice. The value of the fee estate would approach the value of the surface alone and would be based upon its highest and best use (farming, timber growing, etc.). The value of the mineral reserves and any rights thereto would likely be negligible, and this circumstance seems only reasonable, because even if the minerals exist, mining probably will not take place for many years.

If, on the other hand, the mineral deposit to be appraised is adjacent to an active mining area, is owned by the dominant company in that area, has been successfully drilled and sampled (proven), and has been zoned for mineral extraction, the income technique would be used. The value of the fee would approach the combined value of the minerals and mineral rights, and, depending upon the type of mining anticipated, the value of the surface would be relatively insignificant.

Generally the mineral reserve to be valued lies somewhere between these two extremes, and the appraiser uses both the market and the income approaches in his investigation.

BASIC APPRAISAL FACTORS

Regardless of the reason behind the appraisal or the valuation technique used, certain basic factors concerning the mineral deposit must be ascertained, at least in a general manner, before value can be found. The appraiser must determine:

1. Whether or not the deposit actually exists and, if so, its areal extent, thickness, depth, volume, and total in-place tonnage (reserves);
2. The chemical and physical properties of the deposit as they relate to extraction and processing and to the ultimate use(s) of the mineral (quality);
3. What portion of the reserves can and are likely to be mined, processed, and made available for market (recoverability);
4. The rate at which the market will be likely to absorb the recoverable reserves (marketability);
5. The annual cash flow which will likely result from the marketing of the recoverable reserves over the life of the deposit (profitability).

Reserves

The estimation of reserves in Ohio's generally flat-lying bulk mineral deposits can be carried out to the degree of precision warranted by the value of the deposit under

consideration. The appraiser normally starts with a study of the technical information available from government agencies, from industry service organizations, and from private and proprietary files. Next, the appraiser carries out an on-site inspection of the mineral reserve. If the subject deposit is being worked or there are nearby mines, direct visual observations and measurements can be made. Stream cuts, roadcuts, and other natural or manmade excavations are examined wherever possible. Finally, if warranted, a drilling and sampling program at a scale appropriate to the potential worth of the deposit can be designed and initiated. After all the available information is assembled the appraiser then computes the size, shape, location, and in-place tonnage of the subject mineral deposit.

Quality

The determination of the chemical and physical properties of the mineral deposit proceeds along much the same lines and at the same time as the estimation of reserves. The samples collected during the on-site inspection or from the drilling and sampling program are analyzed, and the physical and chemical determinations are projected across the entire deposit in a statistically valid manner. As in the case of reserve estimation, the reliability of the results depends upon such factors as the number of data points (drill holes and samples), their location, their variability, and the skills of the analyst and the appraiser.

Recoverability

Once the location, physical extent, in-place tonnage, and quality of the mineral reserve have been determined, the appraiser must then ascertain how much, if any, of the existing tonnage will actually achieve marketability, that is, reach the point at which it would be offered for sale. Under normal circumstances large portions of any mineral deposit will never be recoverable owing to technical, legal, and economic restrictions.

Tonnage losses due to technical reasons are generally tied to mining and processing methods, equipment capabilities, and physical space limitations. Examples include seams too thin and highwalls too high for existing mining machinery, losses of fines in the comminution process, material required for the support of underground excavations and to provide for the stability of surface slopes, and insufficient spoiling area.

That reserve tonnage which is technically mineable may be further reduced by legal prohibitions such as the required barrier pillars around oil and gas wells and setbacks along property lines, zoning restrictions, and environmental regulations. Lastly, even those minerals which can be recovered technically and legally are subject to additional reductions due to economic considerations such as remoteness and accessibility problems (which lead to high development and transportation costs), poor overburden ratios, small size of deposit, excessive depth, and chemical or physical deficiencies unacceptable in the marketplace.

At this point the total reserves that exist in the deposit have been reduced to what are normally called marketable reserves. In poor-quality deposits this reduction might be 100 percent (none of the mineral would ever be offered for sale), but even in high-quality mineral deposits the total losses may be in excess of 50 percent. It is important to note that these lost minerals are utterly worthless and that only the marketable reserves will enter into any value calculations or considerations.

Marketability

After the tonnage of marketable reserves has been calculated, the appraiser must then estimate the rate at which these reserves will be absorbed into the marketplace over the entire life of the deposit. In the case of an operating mining company, this market absorption rate can be determined by extrapolating (projecting) historical production/sales data into the future based on the correlation of these data with certain demographic and business forecasts. Examples of useful economic indicators in the crushed-stone industry, for example, might be road construction or housing starts; for the coal industry, electric-energy generation would be indicative of future growth or decline.

The production/sales records are normally provided by the business owning the mineral deposit under consideration (or by a grantee, if applicable), and the economic forecasts are generally obtained from external organizations such as federal, state, and local governmental agencies, national or state industry associations, and chambers of commerce. The projections are performed on a statistical basis, and care must be taken to avoid the use of procedures which might lead to unrealistic market expectations. The end result of this process generally is presented as a table showing the expected annual sales rate, in tons, over the entire life of the deposit from the start of mining through the point at which the marketable reserves are exhausted.

Profitability

Lastly, the appraiser must make a determination as to the profit potential or cash-income-generating ability of the mineral reserve. The necessary information is derived from the books, tax forms, and other fiscal records supplied by the company intending to exploit the deposit. This information is analyzed by studying historical operating data—primarily income statements—and then projecting these data into the future predicated upon the anticipated annual sales figures determined in the previous section. The sought-after figure is the annual net cash income, defined as net income after taxes plus depreciation, depletion, amortization, and all deferred deductions. This figure is the true measure of the profitability of the operating company and, once determined for each year of reserve life, can be used by the appraiser to calculate the value of

the deposit.

All five of the basic appraisal factors discussed above are important and usually are considered, at least briefly, in any valuation of a mineral reserve. Obviously the last two factors are of limited interest in a straight market-value approach, but even there they are useful for comparative purposes if similar information can be obtained for like deposits that have recently been traded in the marketplace.

The effort involved and the degree of sophistication sought in the investigation of each of the factors depends to a great extent upon the ultimate dollar value of the mineral reserve being appraised. It makes little sense to expend large sums on a small deposit of limited worth, but substantial amounts can justifiably be spent on large, valuable mineral reserves which promise significant returns.

THE DETERMINATION OF VALUE

Once the basic appraisal factors have been investigated to the appropriate degree, the appraiser has at hand all the information necessary to actually calculate the worth of the mineral reserve in dollars. If the market approach is used, the appraiser gathers all current, relevant sales data from the appropriate county recorders' offices and his personal files, determines whether or not they are truly arm's-length sales, then adjusts them, using the information detailed in the appraisal factors, to render them as comparable as possible to the subject deposit. Normally, the market value which is reported represents the adjusted mean of all those documented sales deemed comparable by the appraiser.

If the income approach is used, the appraiser actually calculates the present worth of the deposit based on the anticipated annual cash flow as determined in the profitability and marketability factors. The capitalization or discount rate used may be an industry standard, a computed value based on the cost of borrowing and managing money at risk, or, more realistically, a figure derived from the actual financial position of the client or his designee. Often a range of dollar values is reported which reflects variations in capitalization rates or net-cash-income projections. The final figures, and in fact the entire format of the valuation report, depend upon the wishes of the client, the exigencies of the situation, and the skill and judgment exercised by the mineral appraiser.

1984 OHIO MINING ACTIVITIES IN BRIEF

Reports were filed in 1984 for 464 coal operations and 574 industrial mineral operations for a total of 1,038 mining operations. Of those reports filed, coal production was reported at 292 operations, and industrial mineral production was reported at 457 operations. There were 11 mines reporting production of coal and one or more industrial minerals and 21 mines reporting the production of multiple industrial minerals (including those mines producing coal and multiple industrial minerals). There were 4,993 new wells drilled for oil and gas in 1984, of which 4,621 were productive and 372 were dry.

The total value³ of coal was \$1,269,230,861 in 1984; the value of oil and gas was \$1,008,403,439; and the total value³ of all industrial minerals was \$283,926,516 in 1984.

³Includes reported and estimated values. Some operations reporting production did not report a value for that production. A statewide average price per ton was calculated for each commodity based on production for which the value was reported. This calculated average was used to estimate the value of production for which the actual value was not reported.

TABLE 1.—1984 Mineral sales and production in Ohio

Commodity	Production ¹	Sales ²
Coal	38,824,002 tons	39,003,446 tons
Limestone and dolomite	28,920,003 tons	36,547,983 tons
Sand and gravel	17,615,885 tons	30,534,343 tons
Salt	4,123,229 tons	3,824,776 tons
Sandstone and conglomerate	1,231,694 tons	2,152,582 tons
Clay	689,779 tons	867,781 tons
Shale	2,403,659 tons	2,405,166 tons
Gypsum	212,392 tons	212,392 tons
Peat	8,697 tons	20,835 tons
Gas	186,479,632 MCF ³	⁴
Oil	15,271,100 barrels	⁴

¹Production as reported. Many operators do not know actual production figures and report only sales.

²Includes material for captive use.

³Thousand cubic feet.

⁴Figure not available.

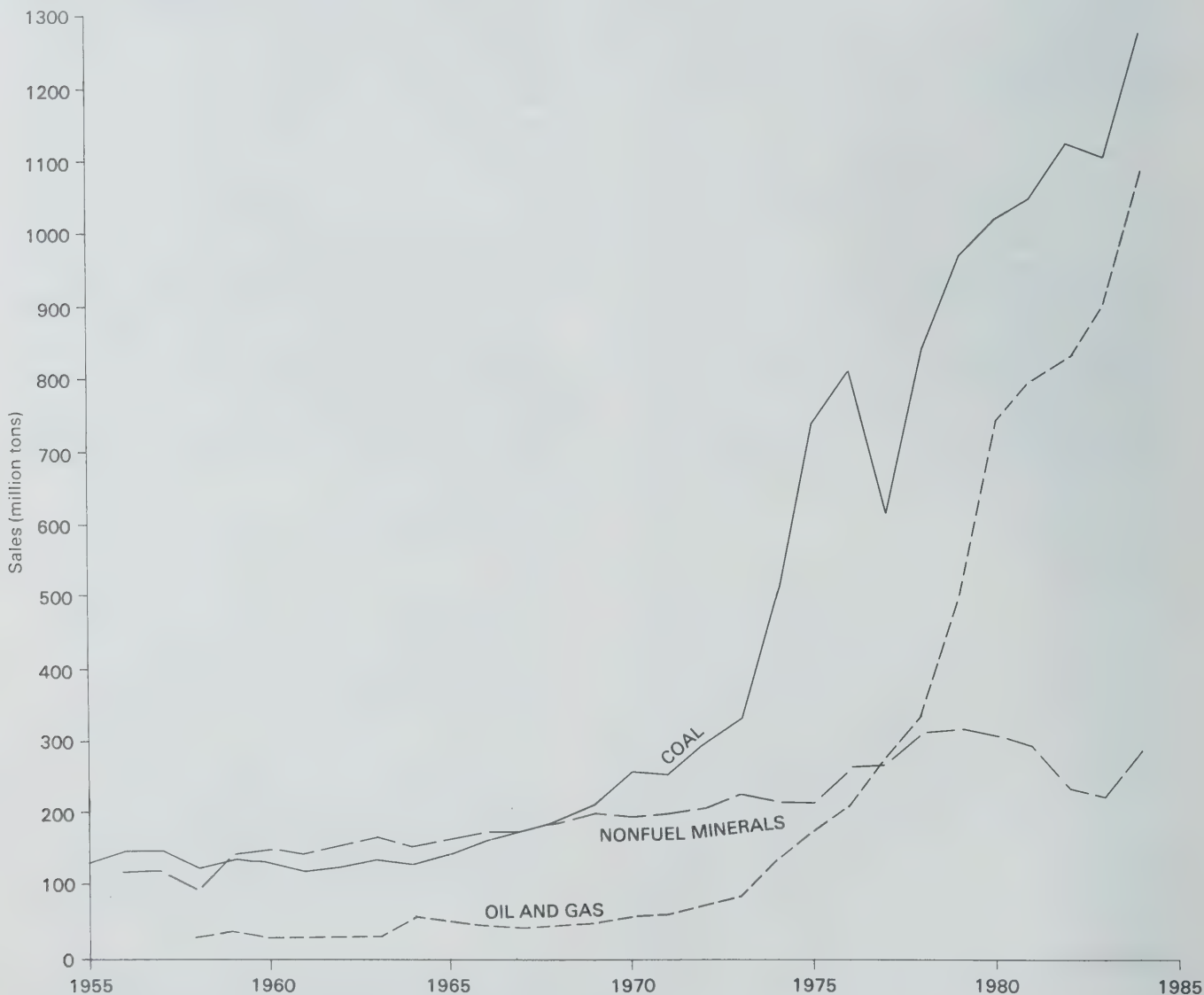


FIGURE 1.—Value of coal, nonfuel minerals, and oil and gas in Ohio.

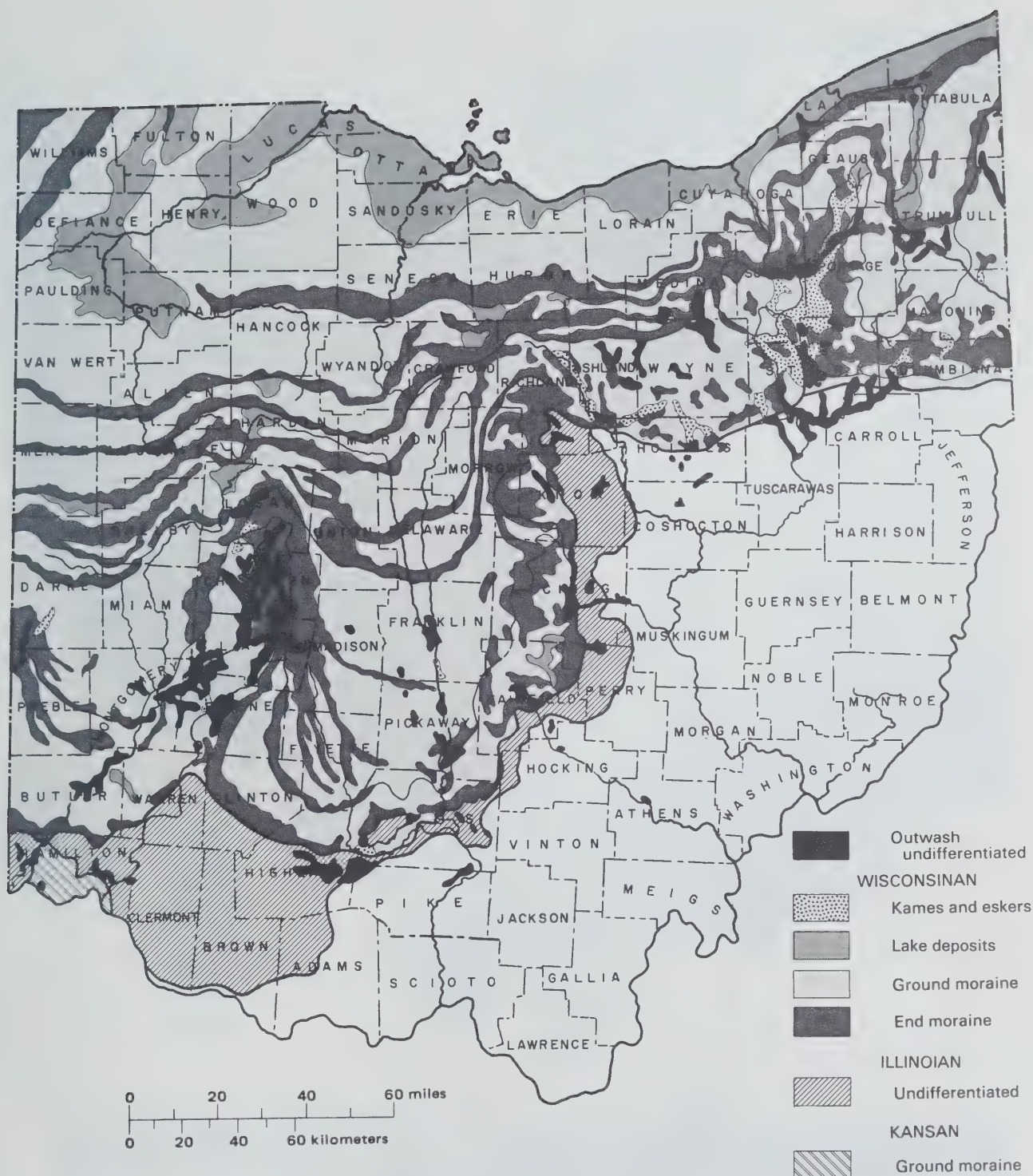


FIGURE 2.—Generalized map of the glacial deposits of Ohio. Continental glaciers advanced over the Ohio landscape several times during the Ice Age. These glaciers deposited unconsolidated materials on top of the bedrock over nearly two-thirds of the state. Most of Ohio's sand and gravel production comes from kames, eskers, and outwash, which were deposited by meltwater from the glaciers. Other glacially derived industrial minerals in Ohio include peat and clay.

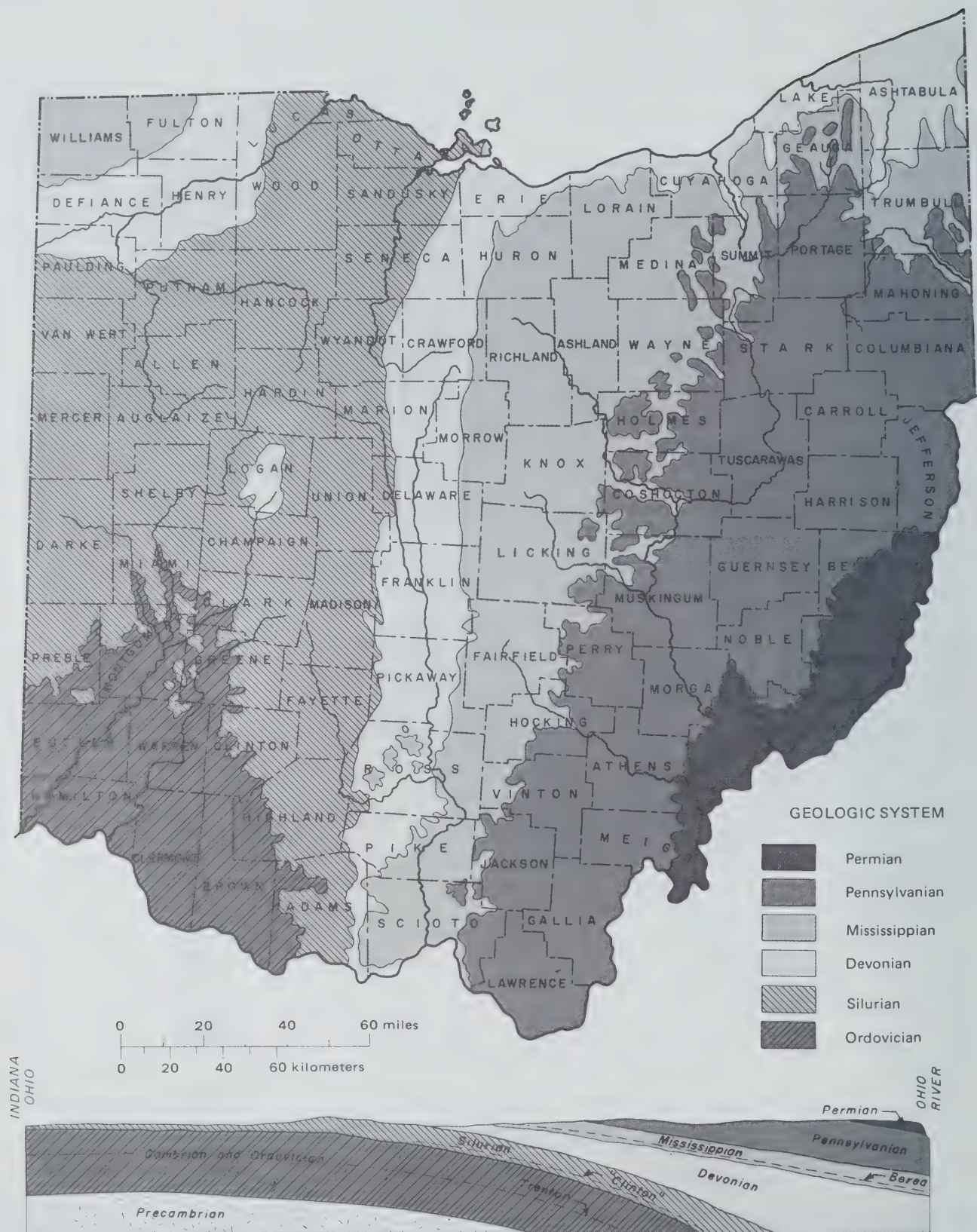


FIGURE 3.—Generalized geologic map and cross section of Ohio. Mineral production occurs throughout Ohio and from every geologic system from the Cambrian to the Permian. Coal, limestone and dolomite, sandstone and conglomerate, shale, clay, gypsum, salt, and oil and gas are produced from Ohio bedrock.

COAL

Coal was produced at 292 mines in 24 Ohio counties during 1984. Production increased 16.9 percent from 1983, totalling 38,824,002 tons in 1984, with 24,652,355 tons produced at 277 surface mines, and 14,171,647 tons produced at 15 underground mines. In comparison to 1983, there were 27 fewer mines reporting production of 50,000 tons or less, 4 more mines producing between 50,000 and 500,000 tons, the same number of mines producing between 500,000 and 1,000,000 tons, and 2 more mines reporting production of 1,000,000 tons or greater; there was a net decrease of 21 mines in 1984.

The five leading counties for 1984 production were Belmont, Meigs, Harrison, Monroe, and Noble Counties; these counties produced 54.0 percent of the 1984 total production. A total of 39,003,446 tons of coal were sold in 1984, with a total value⁴ of \$1,269,230,861. The average price per ton of coal sold was \$32.54.

In underground mining, 63.4 percent of the coal was mined by continuous miner, 35.9 percent of the coal was produced by longwall mining, and 0.7 percent of the coal was produced by conventional mining. In surface opera-

tions, 3.4 percent of the coal produced was auger mined, and the remainder was strip mined.

The Pittsburgh (No. 8) coal was the most heavily mined seam, followed by the Middle Kittanning (No. 6), Meigs Creek (No. 9), Clarion (No. 4A), and Lower Kittanning (No. 5) seams. Coal produced from these five seams made up 78.8 percent of the total 1984 production.

A total of 25,702,586 tons of coal were reported as washed in 1984. Reports from 24 coal-washing plants indicate a 31.0 percent loss in washing.

Trucking was the primary means of coal disposition, carrying 41.1 percent of the total sales. Rail transported 17.2 percent, conveyor belts carried 22.4 percent, and water transport carried 19.0 percent of the coal sold in 1984, and 0.3 percent was handled by other undesignated means. A total of 1.0 percent of the coal produced was reported as stored.

The total average annual employment was reported as 10,223 employees, 6,498 of whom were production employees. The average annual wage earned by production employees was \$30,580, based on those employees for whom wages were reported. Wages earned by all employees totalled \$305,729,707 in 1984.

⁴Includes reported and estimated values. See footnote 3, p. 12.

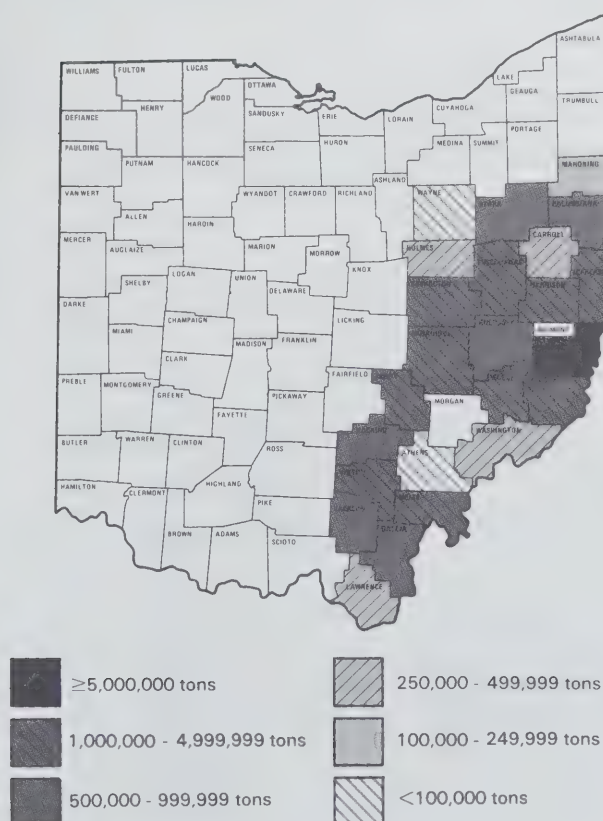


FIGURE 4.—Coal sales in Ohio in 1984, by county.

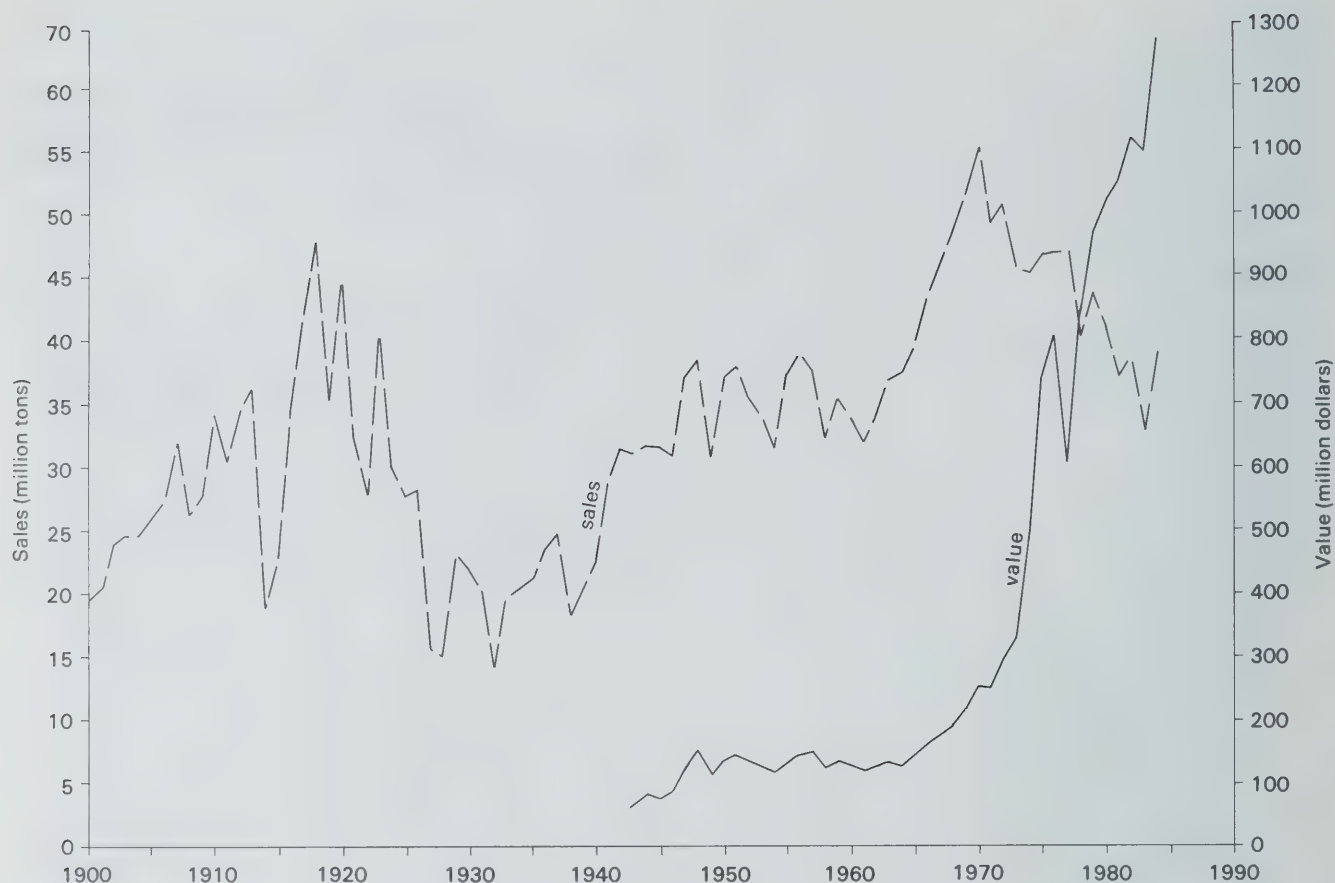


FIGURE 5.—Sales and value of coal in Ohio.

TABLE 2.—1984 Ohio coal production by production-size group and change from 1983

Production-size group	1984		Change from 1983 (short tons)
	Number of mines reporting	Production (short tons)	
Under 25,000 tons	111	1,217,753	-255,954
25,000 to 49,999 tons	54	2,033,703	+1,926
50,000 to 99,999 tons	51	3,437,815	-848,018
100,000 to 249,999 tons	48	7,473,931	+1,917,062
250,000 to 499,999 tons	13	4,545,768	+713,425
500,000 to 999,999 tons	8	6,230,428	+4,076
1,000,000 tons and over	7	13,884,604	+4,074,855
TOTAL	292	38,824,002	+5,607,372

TABLE 3.—1984 Ohio coal production by county and mining method

County ¹	All methods (short tons)	Underground						Surface			
		Number of mines reporting	Production (short tons)					Number of mines reporting	Production (short tons)		
			Total	Hand	Longwall	Conventional	Continuous miner		Total	Strip	Auger
Athens	2,833							1	2,833	2,833	
Belmont	6,863,941	2	1,662,056				1,662,056	51 ²	5,201,885	4,927,424	274,461
Carroll	364,671							9 ²	364,671	360,949	3,722
Columbiana	985,931	1	9,200				9,200	42	976,731	928,893	47,838
Coshocton	1,573,917							13	1,573,917	1,546,063	27,854
Gallia	444,789							3	444,789	444,789	
Guernsey	562,128							8	562,128	398,421	163,707
Harrison	3,914,476	3	2,441,355		1,233,126	93,583	1,114,646	20	1,473,121	1,388,767	84,354
Hocking	544,904							6	544,904	544,904	
Holmes	355,228							7 ²	355,228	351,662	3,566
Jackson	1,036,750	2	108,090	5			108,085	14	928,660	928,660	
Jefferson	2,077,305							21	2,077,305	2,048,881	28,424
Lawrence	392,587							1 ²	392,587	392,587	
Mahoning	183,582							4	183,582	177,125	6,457
Meigs	3,921,351	2	3,921,351		1,648,556		2,272,795				
Monroe	3,474,096	2	3,474,096		2,205,913		1,268,183				
Muskingum	2,213,173							12 ²	2,213,173	2,159,130	54,043
Noble	2,794,430							5	2,794,430	2,771,202	23,228
Perry	2,090,261	2	1,425,479			1,378	1,424,101	7	664,782	654,551	10,231
Stark	917,880							14	917,880	909,199	8,681
Tuscarawas	1,594,545							30	1,594,545	1,500,841	93,704
Vinton	2,235,081	1	1,130,020				1,130,020	7	1,105,061	1,105,061	
Washington	251,520							1	251,520	251,520	
Wayne	28,623							1	28,623	28,623	
TOTAL	38,824,002	15	14,171,647	5	5,087,595	94,961	8,989,086	277	24,652,355	23,822,085	830,270

¹Production from mines operating in more than one county was evenly split between the counties involved unless a by-county breakdown was provided by the operator.²Does not include mines extending into this county from adjoining counties.

TABLE 4.—1984 Ohio coal production by county and month

County ¹	Production (short tons)												
	Total annual	January	February	March	April	May	June	July	August	September	October	November	December
Athens	2,833	1,367	1,466										
Belmont	6,863,941	600,544	591,385	627,882	621,342	708,067	639,135	560,721	703,309	624,690	426,938	418,617	341,311
Carroll	364,671	28,407	29,124	36,664	35,405	39,221	40,496	21,976	20,222	28,110	28,460	31,443	25,143
Columbiana	985,931	100,346	101,692	100,442	95,992	88,011	87,887	56,695	62,631	68,303	98,349	64,667	60,916
Coshocton	1,573,917	136,200	126,788	140,096	144,161	139,806	138,568	135,941	167,461	149,978	107,822	88,834	98,262
Gallia	444,789	29,188	32,165	34,974	24,453	40,068	29,456	43,258	49,213	52,063	32,574	45,089	32,288
Guernsey	562,128	47,758	48,453	53,463	37,436	31,150	41,629	42,947	67,061	59,032	53,990	42,538	36,671
Harrison	3,914,476	306,803	353,282	365,556	309,209	405,824	338,209	267,054	348,342	348,662	360,205	306,862	204,468
Hocking	544,904	55,727	53,856	79,474	57,484	56,543	39,730	49,348	43,913	41,501	33,364	22,850	11,114
Holmes	355,228	41,882	33,391	31,366	30,438	29,630	26,807	29,372	29,092	25,585	27,951	27,188	22,526
Jackson	1,036,750	92,269	89,331	89,534	80,330	94,201	101,715	100,819	103,618	101,544	56,091	56,902	70,396
Jefferson	2,077,305	200,866	178,362	174,517	174,238	178,245	162,783	168,317	196,066	209,614	114,601	159,932	159,764
Lawrence	392,587	38,048	41,774	35,991	31,694	49,147	44,113	26,605	30,413	31,508	19,190	26,277	17,827
Mahoning	183,582	22,749	15,923	11,782	10,225	17,988	9,400	14,736	21,448	15,369	17,121	11,165	15,676
Meigs	3,921,351	335,045	370,360	412,333	325,349	336,050	233,640	247,162	346,124	314,888	362,795	314,548	323,057
Monroe	3,474,096	292,451	319,125	326,229	299,007	342,517	240,040	247,375	274,415	217,405	318,221	288,283	309,028
Muskingum	2,213,173	177,143	174,155	163,354	189,275	223,110	205,658	167,118	193,451	225,334	185,723	169,664	139,188
Noble	2,794,430	203,170	247,300	289,205	254,750	247,254	175,345	269,920	279,674	244,974	206,740	194,718	181,380
Perry	2,090,261	167,777	143,517	180,019	130,115	189,500	158,447	182,731	243,152	247,456	145,159	157,971	144,417
Stark	917,880	76,672	67,390	78,491	64,548	59,716	72,540	112,772	109,191	90,817	77,141	58,929	49,673
Tuscarawas	1,594,545	135,666	128,264	138,505	145,245	146,198	148,497	155,504	146,012	118,356	124,450	102,929	104,919
Vinton	2,235,081	184,006	200,760	241,414	182,599	206,195	190,032	202,875	244,228	227,383	139,136	107,623	108,830
Washington	251,520		21,234	27,779	25,822	32,888	32,053	53,767	21,358	20,419		9,720	6,480
Wayne	28,623	3,566	1,817	2,426	3,127	2,059	2,730	2,637	3,003	2,096	1,972	1,662	1,528
TOTAL	38,824,002	3,277,650	3,370,914	3,641,496	3,272,244	3,663,388	3,158,910	3,159,650	3,703,397	3,465,087	2,937,993	2,708,411	2,464,862

¹Production from mines operating in more than one county was evenly split between the counties involved unless a by-county breakdown was provided by the operator.

TABLE 6.—1984 Disposition of Ohio coal, by county

County ¹	Number of mines	Disposition ¹ (short tons)						Stored
		Total ²	Rail	Water	Truck	Conveyor	Unspecified/ other	
Athens	1	2,833			2,833			
Belmont	53 ³	6,964,318	2,926,863	1,564,654	2,472,418	6,857	383	113,059
Carroll	9 ³	363,065	740	4,700	357,625			1,928
Columbiana	43	987,521			973,812		13,709	
Coshocton	13	1,566,229		210,042	505,352	850,835		3,269
Gallia	4	572,804		326,900	215,302		30,602	6,257
Guernsey	8	563,570		367,286	196,284			
Harrison	23	3,825,977	1,407,419	678,621	1,354,324	385,613		143,810
Hocking	6	545,804		184,607	329,501		31,696	
Holmes	7 ³	355,048			355,048			
Jackson	16	978,770			978,770			30
Jefferson	21	2,074,531		189,402	1,828,739		56,390	4,930
Lawrence	1 ³	360,239		242,909	117,330			7,755
Mahoning	4	182,253			182,253			800
Meigs	2	3,781,903				3,781,903		
Monroe	2	3,479,198		3,479,198				
Muskingum	12 ³	2,205,783	20,377		762,089	1,421,939	1,378	5,890
Noble	5	2,798,747		121,221	398,143	2,279,353	30	
Perry	8	2,153,696	1,188,637		961,871		3,188	15,495
Stark	14	901,270			900,680		590	2,670
Tuscarawas	30	1,833,895	33,993	58,063	1,741,839			82,281
Vinton	8	2,225,849	1,120,788		1,100,926	4,135		
Washington	1	251,520			251,520			
Wayne	1	28,623			28,623			
TOTAL	292	39,003,446	6,698,817	7,427,603	16,015,282	8,723,778	137,966	388,174

¹Tonnage of coal shipped from mines operating in more than one county was evenly split between the counties involved and type(s) of disposition reported unless a by-county breakdown was provided by the operator.

²Does not reflect tonnage stored. Reflects tonnage sold and shipped from mine.

³Does not include mines extending into this county from adjoining counties.

TABLE 7.—1984 Rail shipments of Ohio coal, by county of origin and carrier

County ¹	Number of mines	Shipments ¹ (short tons)				
		Total	Conrail	B & O	N & W	C & O
Belmont	12	2,926,863	1,600,672	438,604	887,587	
Carroll	2	740	740			
Harrison	5	1,407,419	713,901		693,518	
Muskingum	2	20,377	20,377			
Perry	3	1,188,637	1,188,637			
Tuscarawas	1	33,993	453		33,540	
Vinton	1	1,120,788				1,120,788
TOTAL	24	6,698,817	3,524,780	438,604	1,614,645	1,120,788

¹Tonnage of coal shipped from mines operating in more than one county was evenly split between the counties involved and the carriers reported unless a by-county breakdown was provided by the operator.

²Does not include mines extending into this county from adjoining counties.

TABLE 8.—1984 Washed Ohio coal

		Washed coal (short tons)	Percent
By type of mining	From surface mines	12,548,669	48.8
	From underground mines	13,153,917	51.2
	TOTAL ¹	25,702,586	100.0
By seam	Clarion (No. 4A)	5,496,444	21.4
	Middle Kittanning (No. 6)	2,309,237	9.0
	Lower Freeport-Rogers (No. 6A)	955,644	3.7
	Pittsburgh (No. 8)	7,275,366	28.3
	Meigs Creek (No. 9)	5,041,858	19.6
	Waynesburg (No. 11)	1,855,064	7.2
	Other ²	2,768,973	10.8
	TOTAL ¹	25,702,586	100.0

Loss from washing		
	Washed coal (short tons)	Percent
Weight before washing	35,155,083	100.0
Weight after washing ³	24,247,126	69.0
Loss in washing	10,907,957	31.0

¹These figures reflect total washed coal in 1984 and do not necessarily reflect only 1984 production. In 1984, 38.7% of the total production was reported as unwashed. Coal not designated as washed or unwashed was assumed to be unwashed.

²Other = combined Sharon (No. 1), Lower Mercer (No. 3), Upper Mercer (No. 3A), Tionesta (No. 3B), Brookville (No. 4), Lower Kittanning (No. 5), Upper Freeport (No. 7), Redstone (No. 8A), Uniontown (No. 10), Washington (No. 12), and unspecified tonnages of the coals listed in the above table.

³Reported "weight after washing" does not equal totals by type of mining or by seam because all raw tonnages were not reported. Totals were adjusted to arrive at correct loss-in-washing percentage.

TABLE 9.—1984 Dollar value of coal at mine, by county

County ¹	Tonnage sold (short tons)	Value at mine ² (dollars)	Per ton average (dollars)
Athens	2,833	\$41,232	\$14.55
Belmont	6,964,318	220,183,239	31.62
Carroll	363,065	9,740,860	26.83
Columbiana	987,521	19,646,531	19.89
Coshocton	1,566,229	51,990,957	33.19
Gallia	572,804	13,746,792	24.00
Guernsey	563,570	20,337,393	36.09
Harrison	3,825,977	132,254,013	34.57
Hocking	545,804	11,440,670	20.96
Holmes	355,048	6,752,362	19.02
Jackson	978,770	18,769,664	19.18
Jefferson	2,074,531	58,663,746	28.28
Lawrence	360,239	9,892,985	27.46
Mahoning	182,253	3,387,160	18.58
Meigs	3,781,903	185,122,515	48.95
Monroe	3,479,198	137,509,867	39.52
Muskingum	2,205,783	65,144,464	29.53
Noble	2,798,747	97,063,709	34.68
Perry	2,153,696	55,886,313	25.95
Stark	901,270	13,358,612	14.82
Tuscarawas	1,833,895	45,719,484	24.93
Vinton	2,225,849	87,639,981	39.37
Washington	251,520	4,132,474	16.43
Wayne	28,623	805,838	28.15
TOTAL	39,003,446	\$1,269,230,861	\$32.54

¹Sales reported from mines operating in more than one county were evenly split between the counties involved unless a by-county breakdown was provided by the operator.

²The FOB value of coal sold was estimated for those mines which failed to report this information and for those mines which reported an FOB value considered to be unreliable. These estimates were calculated using a statewide-average price per ton based on reported FOB values deemed to be reliable.

TABLE 10.—1984 Ohio coal-mine employment¹, by occupational group and month

Occupational group	Number of employees												
	Monthly average	January	February	March	April	May	June	July	August	September	October	November	December
All production workers	6,498	6,754	6,736	6,852	6,630	6,661	6,607	6,772	6,626	6,599	6,211	5,951	5,572
Underground mines													
Tonnage employees	746	793	753	791	789	794	793	787	728	735	674	707	611
Underground production employees	2,360	2,440	2,367	2,394	2,391	2,401	2,393	2,485	2,330	2,333	2,294	2,326	2,162
Surface production employees	141	148	139	141	142	145	145	159	143	145	132	141	117
Surface mines													
Strip miners	3,217	3,344	3,444	3,494	3,274	3,275	3,229	3,299	3,380	3,354	3,089	2,755	2,663
Auger miners	34	29	33	32	34	46	47	42	45	32	22	22	19
Reclamation	241	173	176	179	212	251	248	248	281	287	299	275	269
Supervisory, technical, and clerical	2,089	2,096	2,128	2,130	2,038	2,051	2,051	2,150	2,154	2,128	2,073	2,046	2,026
Central preparation plant, central shop, etc.	1,395	1,203	1,197	1,195	1,449	1,443	1,451	1,579	1,566	1,565	1,405	1,370	1,316
TOTAL	10,223	10,226	10,237	10,356	10,329	10,406	10,357	10,749	10,627	10,579	9,988	9,642	9,183

¹Reflects employment as reported. Employment was not included for mines which were owner operated or where coal extraction was incidental to principal operation.

TABLE 11.—1984 Ohio coal-mine production employment¹, by county and month

County ²	Number of employees												
	Monthly average	January	February	March	April	May	June	July	August	September	October	November	December
Athens	1	4	4	0	0	0	0	0	0	0	0	0	0
Belmont	1,030	1,019	976	974	1,164	1,173	1,169	1,125	1,117	1,112	919	858	761
Carroll	53	50	49	51	55	56	58	54	56	53	61	49	47
Columbiana	181	209	210	212	185	170	184	154	154	146	212	168	164
Coshocton	280	249	253	251	282	279	271	324	314	311	285	266	270
Gallia	73	66	67	67	71	73	77	79	79	78	74	76	75
Guernsey	73	53	58	57	72	69	68	93	109	102	73	65	52
Harrison	672	645	637	687	698	728	711	718	705	703	688	643	497
Hocking	37	47	54	56	44	44	42	43	43	32	16	11	9
Holmes	22	22	22	22	19	19	19	23	23	25	25	23	21
Jackson	88	80	82	87	79	70	76	93	101	110	101	99	84
Jefferson	265	272	271	261	266	263	270	274	276	283	240	252	248
Lawrence	74	74	74	74	76	75	76	76	76	76	76	65	70
Mahoning	39	35	37	35	37	39	39	40	40	40	41	41	41
Meigs	811	822	824	818	814	813	816	815	812	813	809	805	777
Monroe	835	903	839	854	865	876	871	962	745	756	757	834	763
Muskingum	403	509	544	592	396	393	326	351	394	386	324	320	308
Noble	302	408	429	428	269	271	281	265	267	266	237	249	249
Perry	386	378	382	396	382	378	383	393	404	395	402	372	371
Stark	139	141	139	138	91	96	96	163	169	166	185	137	145
Tuscarawas	277	277	281	285	284	296	291	277	285	283	278	249	238
Vinton	443	486	486	489	461	459	462	440	447	453	404	354	367
Washington	10	0	13	13	15	15	15	7	7	7	0	11	11
Wayne	4	5	5	5	5	6	6	3	3	3	4	4	4
TOTAL	6,498	6,754	6,736	6,852	6,630	6,661	6,607	6,772	6,626	6,599	6,211	5,951	5,572

¹Reflects employment as reported. Employment was not included for mines which were owner operated or where coal extraction was incidental to principal operation.

²For those operations reporting activity in more than one county, employment was evenly split (to the nearest whole employee) between the counties involved unless a by-county breakdown was provided by the operator.

TABLE 12.—1984 Ohio coal-mine employment¹ in central preparation plants, central shops, etc., by county and month

County ²	Number of employees												
	Monthly average	January	February	March	April	May	June	July	August	September	October	November	December
Belmont	183	222	218	215	116	118	118	228	226	226	205	188	117
Carroll	2	2	2	2	2	2	2	2	2	2	2	2	2
Columbiana	31	40	40	40	39	39	39	7	8	8	39	37	37
Coshocton	13	11	11	11	10	10	12	15	18	18	20	12	11
Gallia	15	13	13	11	17	17	17	15	15	15	16	13	14
Guernsey	1	1	1	1	0	0	0	2	2	0	0	0	0
Harrison	207	216	214	211	233	227	231	234	231	230	146	146	163
Hocking	7	5	5	5	7	7	7	16	15	15	0	0	0
Jackson	13	12	12	11	9	9	9	16	16	16	14	14	15
Jefferson	60	60	65	59	55	52	53	60	59	63	68	66	67
Lawrence	12	11	11	11	11	11	13	11	12	12	14	14	14
Mahoning	14	17	15	16	13	13	12	13	13	13	13	14	14
Meigs	235	230	232	234	238	238	238	238	239	238	236	232	230
Monroe	64	79	73	75	80	81	81	65	50	51	43	46	42
Muskingum	4	4	3	4	5	5	5	5	4	3	3	4	5
Noble	303	39	39	40	377	377	379	403	400	400	390	396	397
Perry	56	55	53	57	58	58	58	57	56	54	57	57	57
Scioto	9	12	12	12	12	12	12	6	6	6	6	6	6
Stark	8	2	2	2	2	2	2	27	27	28	1	0	0
Tuscarawas	52	64	64	63	68	67	66	53	55	56	27	20	21
Vinton	98	105	109	112	94	95	94	90	96	95	95	93	94
Washington	6	0	0	0	0	0	0	13	13	13	10	10	10
Wayne	2	3	3	3	3	3	3	3	3	3	0	0	0
TOTAL	1,395	1,203	1,197	1,195	1,449	1,443	1,451	1,579	1,566	1,565	1,405	1,370	1,316

¹Reflects employment as reported. Employment was not included for mines which were owner operated or where coal extraction was incidental to principal operation.²For those operations reporting activity in more than one county, employment was evenly split (to the nearest whole employee) between the counties involved unless a by-county breakdown was provided by the operator.TABLE 13.—1984 Ohio coal-mine production employment¹ in supervisory, technical, and clerical positions, by county and month

County ²	Number of employees												
	Monthly average	January	February	March	April	May	June	July	August	September	October	November	December
Belmont	248	284	285	281	214	214	207	261	257	257	248	238	230
Carroll	10	9	9	9	9	9	9	14	12	12	11	11	11
Columbiana	33	35	35	35	29	29	29	25	28	28	41	39	38
Coshocton	53	50	50	49	50	52	52	58	58	56	53	52	53
Gallia	21	19	19	19	21	23	23	23	22	23	20	21	20
Guernsey	6	6	5	6	6	6	6	5	6	5	6	6	6
Harrison	207	204	205	208	215	220	218	214	220	197	199	193	197
Hocking	9	10	10	10	9	9	9	13	12	11	7	6	4
Holmes	3	3	3	3	2	2	2	2	7	7	3	3	3
Jackson	13	14	14	13	8	8	9	16	19	18	11	11	10
Jefferson	60	60	61	62	68	68	71	53	53	53	58	58	52
Lawrence	21	22	22	22	21	20	22	20	21	20	20	19	20
Mahoning	9	7	7	7	9	9	9	12	12	13	8	8	8
Meigs	321	310	316	318	313	319	319	321	328	332	331	326	325
Monroe	264	265	268	270	272	274	276	276	264	264	256	244	241
Muskingum	113	113	116	116	111	110	109	119	120	115	111	111	111
Noble	103	91	105	103	95	95	99	112	110	112	98	107	107
Perry	96	98	96	97	97	97	95	96	96	94	94	94	95
Scioto	2	3	3	3	3	2	2	1	1	1	1	1	1
Stark	19	19	19	19	16	16	17	22	22	22	17	17	17
Tuscarawas	55	56	59	60	50	50	50	57	53	56	57	58	53
Vinton	114	115	111	110	113	112	111	117	120	119	115	115	116
Washington	6	0	7	7	4	4	4	10	10	10	5	5	5
Wayne	303	303	303	303	303	303	303	303	303	303	303	303	303
TOTAL	2,089	2,096	2,128	2,130	2,038	2,051	2,051	2,150	2,154	2,128	2,073	2,046	2,026

¹Reflects employment as reported. Employment was not included for mines which were owner operated or where coal extraction was incidental to principal operation.²For those operations reporting activity in more than one county, employment was evenly split (to the nearest whole employee) between the counties involved unless a by-county breakdown was provided by the operator.

TABLE 14.—1984 Ohio surface coal-mine reclamation employment¹, by county and month

County ²	Number of employees												
	Monthly average	January	February	March	April	May	June	July	August	September	October	November	December
Belmont	54	58	53	51	48	66	49	52	59	53	61	49	48
Carroll	0	0	0	0	0	0	0	0	0	0	1	2	2
Columbiana	6	1	1	1	0	5	5	5	7	8	13	12	12
Coshocton	10	1	2	2	9	19	18	14	19	18	10	6	7
Guernsey	11	4	3	5	15	14	16	8	15	17	13	10	8
Harrison	15	0	3	1	16	19	16	19	19	19	22	20	22
Hocking	5	2	2	2	2	2	5	6	6	12	7	7	6
Holmes	4	2	2	2	5	4	4	3	4	4	4	6	8
Jackson	0	0	0	0	0	0	0	0	0	0	2	2	2
Jefferson	23	10	7	8	8	9	13	8	21	24	60	54	52
Mahoning	0	0	0	0	0	0	0	0	0	0	1	1	0
Muskingum	44	37	37	39	47	47	47	53	55	51	45	37	37
Noble	50	38	43	43	49	50	54	60	60	59	45	48	48
Perry	2	1	1	1	1	1	1	3	3	7	3	3	3
Stark	2	2	2	3	1	1	2	1	1	2	3	2	1
Tuscarawas	5	7	7	7	2	2	4	4	4	4	7	8	5
Vinton	5	10	9	10	5	8	10	4	1	1	2	0	0
Washington	5	0	4	4	4	4	4	8	7	8	0	8	8
TOTAL	241	173	176	179	212	251	248	248	281	287	299	275	269

¹Reflects employment as reported. Employment was not included for mines which were owner operated or where coal extraction was incidental to principal operation.²For those operations reporting activity in more than one county, employment was evenly split (to the nearest whole employee) between the counties involved unless a by-county breakdown was provided by the operator.

TABLE 15.—1984 Wage and salary payments to Ohio coal-mine employees, by county and occupational group

County ¹	Wage and salary payments (nearest whole dollar) ²								
	All occupations	Supervisory, technical, and clerical	Tonnage employees	Underground production employees	Surface production employees	Strip miners	Auger miners	Reclamation	Central preparation plant, central shop, etc.
Athens	\$13,090					\$13,090			
Belmont	46,631,159	8,193,360	4,518,402	6,853,650	1,184,710	17,790,361	47,520	2,026,303	6,016,853
Carroll	1,427,259	166,146				1,233,633		7,898	19,582
Columbiana	4,866,363	556,689				3,443,782	50,547	97,157	718,188
Coshocton	13,446,710	2,014,055				10,649,475	84,605	344,807	353,768
Gallia	2,377,940	391,824				1,709,498			276,618
Guernsey	3,055,513	241,647				2,240,296	165,257	395,193	13,120
Harrison	37,442,945	8,091,561	6,413,521	9,862,555	1,053,997	5,472,006	2,108	555,448	5,991,749
Hocking	1,513,811	247,273				975,365		103,023	188,150
Holmes	725,187	101,599				533,833		89,755	
Jackson	2,634,085	443,932		169,516	17,972	1,643,013		5,500	354,152
Jefferson	11,761,483	1,684,465				7,529,334	30,308	745,625	1,771,751
Lawrence	2,331,541	478,806				1,643,619			209,116
Mahoning	1,503,941	190,045				966,732	3,052	2,645	341,467
Meigs	49,176,006	12,421,625		27,865,944					8,888,437
Monroe	39,902,773	9,799,869	8,872,223	16,406,601	2,534,017				2,290,063
Muskingum	16,177,097	4,022,772				11,042,004	16,286	1,008,153	87,882
Noble	20,426,461	3,048,670				10,317,635		946,702	6,113,454
Perry	15,339,517	3,699,432	2,823,337	4,715,906		2,592,603	30,547	32,945	1,444,747
Scioto	723,273	117,180							606,093
Stark	2,253,394	361,804				1,833,012	8,250	26,204	24,124
Tuscarawas	9,304,539	1,337,394				6,522,074	155,101	127,291	1,162,679
Vinton	21,911,952	4,551,342		10,771,466		3,079,550		143,016	3,366,578
Washington	600,732	109,490				294,155		112,383	84,704
Wayne	182,936	15,000				111,993			55,943
TOTAL	\$305,729,707	\$62,285,980	\$22,627,483	\$76,645,638	\$4,790,696	\$91,637,063	\$593,581	\$6,770,048	\$40,379,218

¹For those operations reporting activity in more than one county, wage and salary payments were evenly split between the counties involved unless a by-county breakdown was provided by the operator.²For those operations reporting only a total wage and salary payment to all workers, an equal pay rate was assumed for all employees. In cases where quarterly employment was reported but wage and salary payments were not, wage and salary payments for that quarter were estimated from reported payments in the other quarters to arrive at the annual figure.

INDUSTRIAL MINERALS

Industrial minerals, other than mineral fuels, were produced in a total of 83 Ohio counties in 1984. The combined value of all nonfuel industrial minerals sold in 1984 was \$283,926,516.

The total average annual employment reported in 1984 production of industrial minerals was 3,478 employees. There were 457 operations producing industrial minerals, 21 of which produced more than one mineral commodity. These multiple-commodity operations employed 177 people. Seven operations employed 24 people to produce clay and shale; one operation employed 4 people to produce limestone and sand and gravel; two operations employed 35 people to produce limestone and shale; four operations employed 45 people to produce limestone and clay; three operations employed 60 people to produce limestone, clay, and shale; one operation employed four people to produce sandstone and sand and gravel; one operation employed two people to produce limestone, sand and gravel, and clay; one operation employed two people to produce sandstone, clay, and shale; and one operation employed one person to produce clay and sand and gravel. These employees worked an average of 212 days and earned an average annual wage of \$20,387. Total wages reported for those employees producing multiple commodities were \$3,608,482.

The total reported wages for all employees producing industrial minerals in 1984 were \$76,383,242. The average annual wage, based on those employees for whom wages were reported, was \$22,051.

TABLE 16.—1984 Value of Ohio industrial minerals

Commodity	Value ¹	Percent of total
Limestone and dolomite	\$122,205,264	43.1
Sand and gravel	91,222,354	32.1
Salt	35,844,802	12.6
Sandstone and conglomerate	24,488,305	8.6
Shale	3,130,752	1.1
Clay	4,921,116	1.7
Gypsum	2,017,724	0.7
Peat	96,199	0.1
TOTAL	\$283,926,516	100.0

¹The FOB value of industrial minerals sold was estimated for those mines which failed to report this information and for those producing material for captive use. These estimates were calculated using a statewide-average price per ton based on reported FOB values.

TABLE 17.—1984 Employment at Ohio industrial mineral operations, by county and commodity

County ¹	Number of employees ²									
	Total	Limestone and dolomite	Sand and gravel	Sandstone and conglomerate	Clay	Shale	Salt	Gypsum	Peat	Multiple commodities
Adams	31	31								
Allen	50	44	6							
Ashland	11		11							
Ashtabula	2		2							
Athens	33	25	8							
Auglaize	29	19	8		2					
Belmont	34	18	16							
Brown	1	1								
Butler	86		86							
Carroll	17	12	3	2						
Champaign	17		17							
Clark	32	1	31							
Clermont	8		8							
Clinton	18	18								
Columbiana	11		4	3	1	2				4
Coshocton	44		20	22						2
Crawford	34	34	3							
Cuyahoga	248		2	5		2	239			
Darke	14	9	5							
Defiance	3		3							
Delaware	60	60								
Erie	94	84	4	6						
Fayette	24	24								
Fairfield	4		4							
Franklin	168	50	111			7				
Gallia	2		2							
Geauga	74			74						
Greene	41	10	29		2					
Hamilton	86		86							
Hancock	29	29								

TABLE 17.—1984 *Employment at Ohio industrial mineral operations, by county and commodity*—Continued

County ¹	Number of employees ²									
	Total	Limestone and dolomite	Sand and gravel	Sandstone and conglomerate	Clay	Shale	Salt	Gypsum	Peat	Multiple commodities
Hardin	14	14								
Harrison	1					1				
Henry	4		4							
Highland	19	19								
Hocking	27		25							2
Holmes	44	15	9	4	3	1				15
Huron	3		2	1						
Jackson	7				2					5
Knox	82		40	42						
Lake	128		3				125			
Lawrence	10		2			5				3
Licking	37		34			1	2			
Logan	41	26	7						8	
Lorain	34		3	34						
Lucas	65	55	10							
Mahoning	47	14	3	1					4	32
Marion	39	32	5			2				
Medina	39		38							1
Meigs	13		13							
Mercer	25	25								
Miami	75	58	17							
Monroe	8	8								
Montgomery	58	14	44							
Morgan	14	1	13							
Morrow	7		7							
Muskingum	96	60	7		1					28
Noble	14	14								
Ottawa	111	95						16		
Paulding	27	10								17
Perry	66	4		62	4					
Pickaway	22		22							
Pike	25	9	16							
Portage	122		122							
Preble	17	6	11							
Putnam	10	9			1					
Richland	24		24							
Ross	26		8	18						
Sandusky	117	117	4							
Scioto	18		8	9	1					
Seneca	60	60	4							
Shelby	33	21	12							
Stark	71	1	42		2					26
Summit	32		31				1			
Trumbull	12		7	5						
Tuscarawas	93		22	7	21	5				38
Union	19	19								
Van Wert	25	25								
Warren	25	4	25							
Washington	24	3	21							
Wayne	39		24				15			
Williams	14		10						4	4
Wood	25	25								
Wyandot	157	145	11		3				1	
Maumee River	7		7							
Lake Erie	8		8							
TOTAL	3,478	1,373	1,170	292	33	26	382	16	9	177

¹For those operations reporting activity in more than one county, employment was evenly split (to the nearest whole employee) between the counties involved unless a by-county breakdown was provided by the operator.

²Reflects employment as reported. Employment is not included for mines which were owner operated.

³Averages fewer than one employee per month.

⁴Employment not reported by operators working in this county.

LIMESTONE AND DOLOMITE

Limestone and dolomite were produced at 115 operations in 51 Ohio counties during 1984. Sales of limestone and dolomite totalled 36,547,983 tons, with Erie, Sandusky, Franklin, Wyandot, and Mahoning Counties accounting for 36.3 percent of those sales. Reported known production totalled 28,920,003 tons.

Lime produced from Ohio limestone and dolomite totalled 1,456,887 tons in 1984, and came from five opera-

tions in Ottawa, Sandusky, and Wyandot Counties.

The total value⁵ of limestone and dolomite sold in 1984 was \$122,205,264, with an average price per ton of \$3.34. An annual average of 1,373 employees collected a total of \$31,735,973 in wages. These employees worked an average of 181 days to collect an average annual wage of \$23,114. An additional 146 employees mined limestone and dolomite along with one or more other mineral commodities.

Primary uses for crushed and broken limestone and dolomite were building, stone for portland cement concrete, and stone for bituminous concrete. Other major uses for various forms of the stone included the manufacture of portland cement and aglime (a noncalcined product).

⁵Includes reported and estimated values. See footnote 3, p. 12.

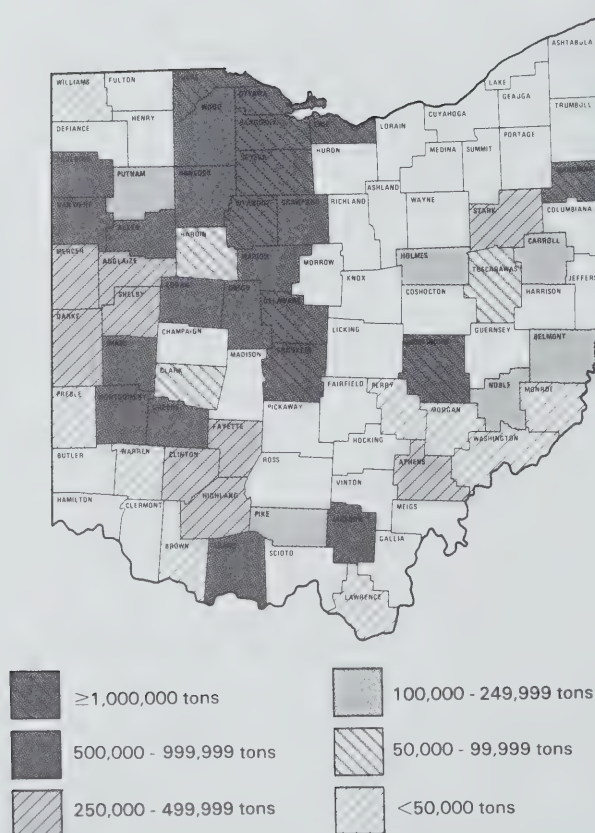


FIGURE 6.—Sales of limestone and dolomite in Ohio in 1984, by county.

TABLE 18.—1954 Ohio limestone and dolomite sales, by county and type

County	Tons sold												Raw stone for burning	Agricultural stone (aglime)	For portland cement manufacture	Dimension stone	Unspecified/ other	Unspecified/ other
	Crushed and broken stone										Refrac- tory stone							
	Total, all types	Total	Riprap	Metallurgical stone	Stone for portland cement concrete	Stone for bituminous concrete	Building, road base, resurfacing	Railroad ballast	Unspecified/ other									
Adams	746,698	694,597	21,918	39,871	39,474	68,352	562,933	122,589	30,401			30,908	4,478			21,193		
Allen	910,243	891,494	3,969		12,622		659,875		24,087			10,271				4,000		
Athens	411,622	411,622					411,622					2,903						
Auglaize	387,916	385,013	12,883				372,044	86										
Belmont	173,577	173,577	14,988				158,589											
Brown	5,352	5,352					5,352											
Carroll	125,966	125,966					125,966											
Clark	90,259	90,259					90,259											
Clinton	334,300	313,300	35,000		17,500	50,000	210,800											
Crawford	842,637	777,380	10,012				570,373	165										
Darke	264,890	264,890					264,890											
Delaware	1,599,273	1,570,279	3,934		487,789	218,055	1,565,487	128										
Erie	3,107,017	2,805,896	55,964				2,002,293	41,795										
Fayette	386,701	302,287					302,287											
Franklin	2,604,880	2,604,880					2,604,880											
Greene	889,524	177,297					177,297											
Hancock	743,412	743,412	13,518		26,410		497,673	205,811										
Hardin	92,826	85,921	323		1,044		84,554											
Highland	416,624	387,992	3,219		3,436	12,602	334,510											
Holmes	229,097	229,097					229,097											
Jackson	651,688	651,688					530,908											
Lawrence	732	732					732											
Logan	502,650	288,437	19,522		28,940	36,113	203,862											
Lucas	1,784,304	1,784,304	10,041		185,013	176,665	1,397,384											
Mahoning	2,068,302	247,974					247,974											
Marion	605,435	582,777	3,641		21,936	38,698	463,388	52,520										
Mercer	316,806	297,061	1,237		283		295,541											
Miami	803,241	745,010	2,219		21,739		397,530	79,120										
Monroe	44,249	44,249					44,249											
Montgomery	520,410	475,026					475,026											
Morgan	23,398	23,398					23,398											
Muskingum	1,777,743	1,193,434	40,000		188,852	74,112	890,470											
Noble	228,002	228,002			228,002		228,002											
Ottawa	2,025,301	1,809,183	138,566		487,772	286,031	761,984											
Paulding	886,892	507,543	5,351		33,646	46,183	407,998											
Perry	45,182	45,182					45,182											
Pike	204,840	181,517	4,955		25,335	10,172	131,031	9,232										
Preble	37,269	35,198	3,270				31,928											
Putnam	161,694	149,927	919				149,008											
Sandusky	3,091,690	724,605	318,031		13,969	14,835	77,576											
Seneca	1,357,043	1,173,395	18,573				1,154,822											
Shelby	331,956	330,699	40,083		76,395		133,047	81,174										
Stark	288,186	286,413	170,000				116,413											
Tuscarawas	57,651	57,651	554				57,087											
Union	546,077	522,641	2,237		27,000		493,404											
Van Wert	513,172	448,610	13,526		138,296	167,358	39,529	790										
Warren	440	440					440											
Washington	4,046	4,046	781				3,265											
Williams'	12,331	12,331																
Wood	903,895	724,321	14,721		90,061	117,725	477,103	13,332										
Wyandot	2,390,544	1,972,019	5,900		205,245	166,482	815,879	79,545										
TOTAL	36,547,983	28,576,373	989,855	326,744	2,056,362	1,559,778	21,324,911	686,287	33,923	1,598,513	1,446,063	1,988,038	2,806,680	982,316				

Includes sales of limestone in Williams County. No limestone mined there.

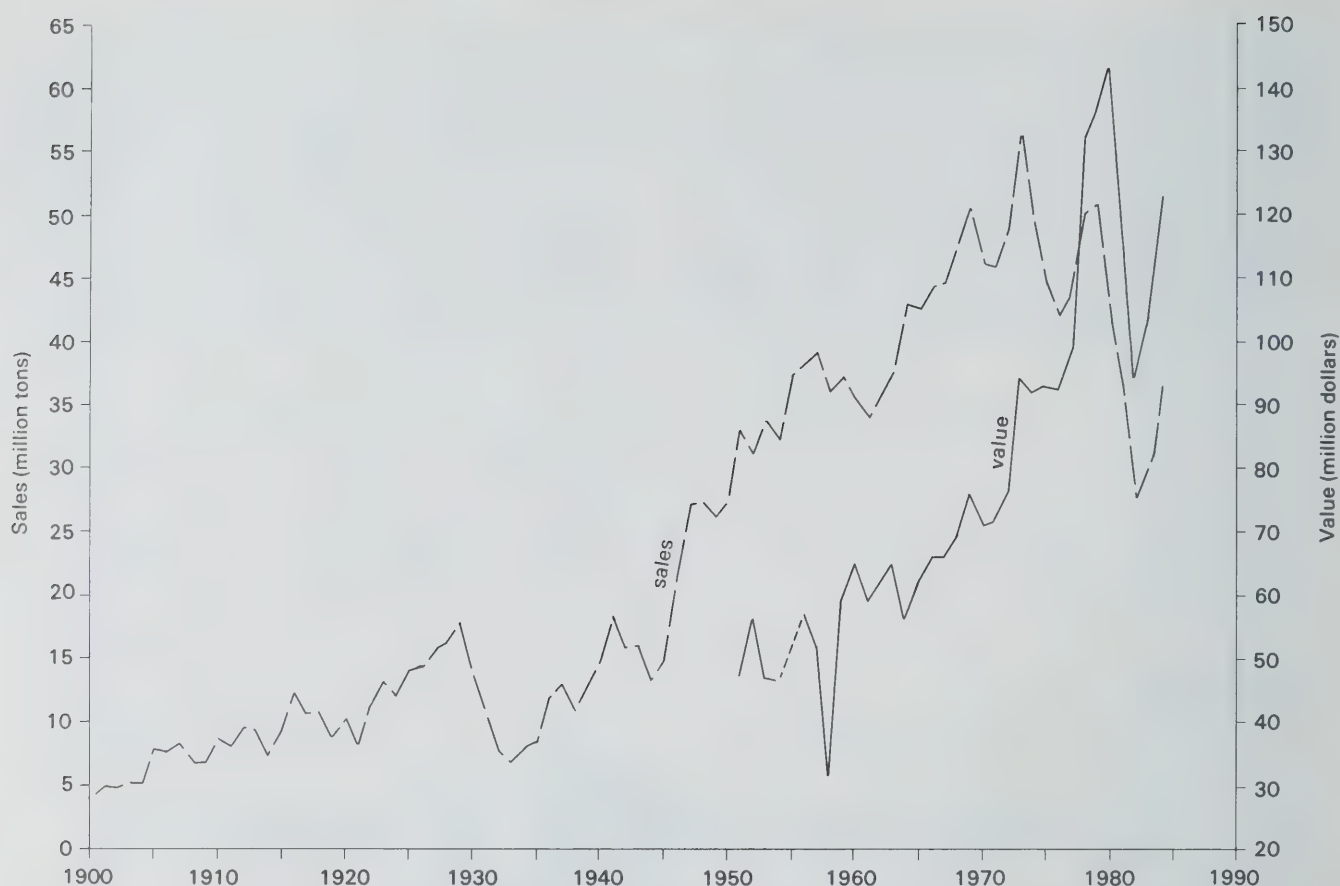


FIGURE 7.—Sales and value of limestone and dolomite in Ohio. Value line dashed where data not available.

TABLE 19.—1984 Production of lime from Ohio stone,
by county and type

County	Total tons	Building (tons)	Chemical and industrial (tons)	Refractory (tons)	Other (tons)
Ottawa	106,328	54,239	52,089		
Sandusky	1,212,839		838,445	27,457	346,937
Wyandot	137,720		137,720		
TOTAL	1,456,887 ¹	54,239	1,028,254	27,457	346,937

¹Burning produced a 48.1 percent weight loss.

SAND AND GRAVEL

Sand and gravel were sold or produced at 269 operations in 62 Ohio counties during 1984. Total sales⁶ of sand and gravel were 30,534,343 tons, of which sand comprised 14,506,115 tons and gravel comprised 16,028,228 tons. Hamilton, Franklin, Butler, Portage, and Stark Counties led in sales, accounting for 46.7 percent of the total. Reported known production⁶ of sand and gravel totalled 17,615,885 tons in 1984.

A total of 194,796 tons of sand were dredged from Lake

⁶Please note—Sales and production figures for sand and gravel include material dredged from Lake Erie and the Maumee River.

⁷Includes reported and estimated values. See footnote 3, p. 12.

Erie, and 91,694 tons of sand and 56,172 tons of gravel were dredged from the Maumee River. Total sand and gravel production from Lake Erie and the Maumee River was 342,662 tons in 1984.

The value⁷ of sand and gravel sold in 1984 totalled \$91,222,354, with an average price per ton of \$2.99. An annual average of 1,170 employees worked an average of 139 days for total reported wages of \$22,506,494. The average annual wage, based on those employees for whom wages were reported, was \$19,319. An additional 11 employees mined sand and gravel along with one or more other mineral commodities.

Road construction and resurfacing, building, portland cement concrete, and bituminous concrete were the major uses for Ohio sand and gravel in 1984.

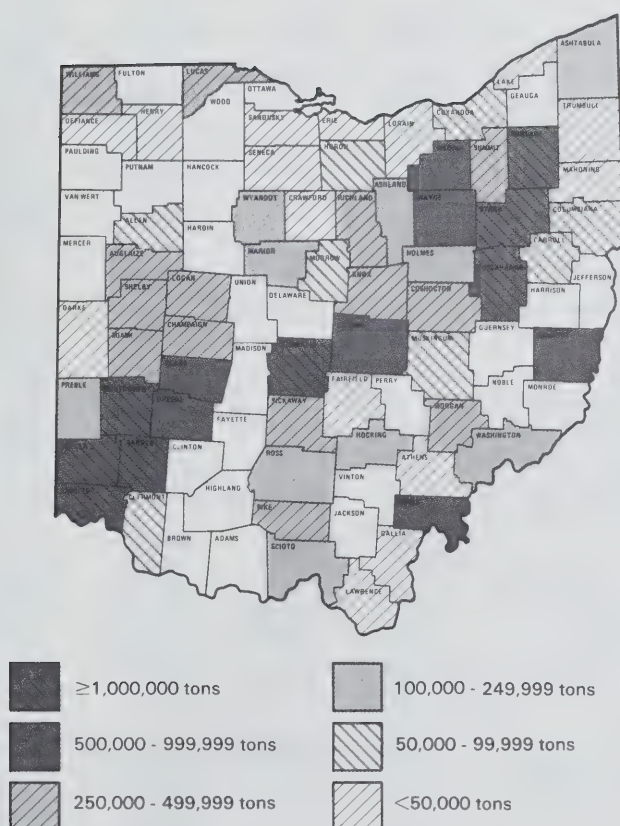


FIGURE 8.—Sales of sand and gravel in Ohio in 1984, by county.

TABLE 20.—1984 Ohio sand sales, by county and type

County	Tons sold							
	Total	Foundry	Portland cement concrete	Bituminous concrete	Building	Road construction, resurfacing	Filtration	Other/unspecified
Allen	44,946		6,365		15,402	20,833		2,346
Ashland	115,243		24,517		21,172	67,450		2,104
Ashtabula	153,203		27,790		15,567	88,168		21,678
Athens	20,653			1,638	5,077			13,938
Auglaize	115,411		109,422		5,989			
Belmont	244,464		173,828	60,589				10,047
Butler	1,118,703		120,743	38,745	139,842	729,923		89,450
Carroll	47,581					47,581		
Champaign	115,745				21,352	83,320		11,073
Clark	365,910	850	89,993	70,791	30,022	174,254		
Clermont	26,773							26,773
Columbiana	42,977		18,307		6,309	7,643		10,718
Coshocton	141,420			6,484	59,084	64,117		11,735
Crawford	808							808
Cuyahoga	76,202							76,202
Darke	16,776		8,000		5,450			3,326
Erie	22,749	4,519						18,230
Fairfield	3,589					2,455		1,134
Franklin	1,089,479		67,349	118,831	236,611	661,010	5,678	
Gallia	9,596	1,661						7,935
Greene	348,593		35,309	13,698	9,158	154,148		136,280
Hamilton	2,221,196		133,778	86,597	122,557	1,619,590		258,674
Henry	19,059				2,295	16,764		
Hocking	90,533		26,036	23,049	11,187	15,456	2,836	11,969
Holmes	65,082		9,118	9,762	1,588	34,437	300	9,877
Huron	46,851		2,354		38,130	1,239	4,702	426
Knox	154,931		32,742	23,028	15,756	31,815		51,590
Lake	23,842				23,372			470
Lawrence	35,645	743				1,482		33,420
Licking	277,389	74,640			31,257	134,492		37,000
Logan	101,602		49,629	1,720	4,927			45,326
Lorain	960							960
Lucas	382,822				378,645	4,177		
Mahoning	1,705				1,128			577
Marion	104,849				104,387	462		
Medina	564,269			92,663	147,159	288,434		36,013
Meigs	346,514			309,073	26,587	10,854		
Miami	140,127							140,127
Montgomery	388,434		83,332	44,469	112,338	138,063		10,232
Morgan	77,730		9,277	4,824	7,051	4,824		51,754
Morrow	18,283				17,685	598		
Muskingum	57,871			39,794	9,959			8,118
Pickaway	153,012				6,600	1,771		144,641
Pike	239,004		147,655	45,563	39,947			5,839
Portage	1,618,717	21,654	472,082	184,592	149,454	235,991	946	553,998
Preble	54,779		11,498	5,299	22,086	15,896		
Richland	39,551			6,794	17,346	12,760		2,651
Ross	60,549		1,388	28,928	8,915	4,636		16,682
Sandusky	6,000							6,000
Scioto	208,777		111,289	95,500				1,988
Seneca	1,806							1,806
Shelby	159,251		79,453	15,000		275		64,523
Stark	543,092		116,363	206,483	129,450	44,787	626	45,383
Summit	262,189	7,661			133,403	77,511		43,614
Trumbull	3,312			2,799	285			228
Tuscarawas	502,729		68,140	108,726	115,655	167,474		42,734
Warren	280,423		3,648		33,352	150,505		92,918
Washington	57,073			8,340	25,985	18,584		4,164
Wayne	288,030		56,044	49,416	3,572			178,998
Williams	296,244		94,733		5,691	194,965	855	
Wyandot	204,572		86,421	33,081	72,249	4,000	1,871	6,950
Lake Erie	194,796		110,194					84,602
Maumee River	91,694		79,349		12,345			
TOTAL	14,506,115	111,728	2,466,146	1,736,276	2,403,378	5,332,744	17,814	2,438,029

TABLE 21.—1984 Ohio gravel sales, by county and type

County	Tons sold						
	Total	Building	Portland cement concrete	Bituminous concrete	Road construction, resurfacing	Filtration	Other/ unspecified
Allen	35,885	19,101				1,000	15,784
Ashland	122,240	22,983			68,614		30,643
Ashtabula	71,342	17,388			32,113	1,520	20,321
Athens	8,086	3,349		1,638			3,099
Auglaize	186,453	1,600	149,271		23,120		12,462
Belmont	256,846		122,651	70,024	55,828		8,343
Butler	1,469,733	382,004	31,156		1,047,956		8,617
Carroll	36,216				36,216		
Champaign	211,787	49,379			119,902		42,506
Clark	633,157	94,021	117,940	80,657	250,453		90,086
Clermont	34,157						34,157
Columbiana	48,846	14,367	2,000		3,367	11,043	18,069
Coshocton	130,746	36,378		9,735	68,741		15,892
Crawford	808						808
Cuyahoga	3,000	3,000					
Darke	12,554	2,479	2,000		503		7,572
Defiance	1,951				1,951		
Fairfield	4,105				2,900		1,205
Franklin	1,653,095	388,008	53,511	107,140	1,098,277	4,209	1,950
Gallia	3,401						3,401
Greene	501,351	4,798	56,155	16,442	216,033	1,024	206,899
Hamilton	2,772,235	715,850	9,567	12,262	1,763,545		271,011
Hocking	48,293	5,360	2,450	19,440	8,983	1,950	10,110
Holmes	102,627	11,422	6,198	9,762	44,619	20,084	10,542
Huron	17,122	16,695					427
Knox	342,531	24,912	41,552	26,177	57,454		192,436
Lake	21,771	20,261					1,510
Licking	365,249	58,323		10,327	215,655		80,944
Logan	212,970				40,000		172,970
Mahoning	5,111	3,380					1,731
Marion	25,617	1,259					24,358
Medina	329,788	161,484			168,304		
Meigs	276,526	49,997		178,621	47,748		160
Miami	227,820	2,626					225,194
Montgomery	810,547	272,167	120,889	61,460	220,558	6,518	128,955
Morgan	181,090	2,227	17,865	8,959	22,320	8,958	120,761
Morrow	59,142	22,158			31,213	2,361	3,410
Muskingum	30,749	6,113		14,299			10,337
Pickaway	154,971	6,600			1,772		146,599
Pike	38,173	19,069	5,300		2,500	967	10,337
Portage	899,649	224,014	40,300	128,725	193,679	6,356	306,575
Preble	103,374	36,560	17,940	8,522	40,352		
Richland	280,473	180,958		8,334	84,593		6,588
Ross	60,674	18,402		13,120	8,408	1,171	19,573
Scioto	24,827	17,543		1,000	500		5,784
Seneca	1,414						1,414
Shelby	177,501		79,453	16,641			81,407
Stark	866,112	77,554	80,430	354,105	336,620	1,428	15,975
Summit	193,250	104,919			83,045		5,286
Trumbull	4,693				4,666		27
Tuscarawas	538,497	134,835	53,413	78,146	266,479		5,624
Warren	967,805	436,260	2,782	866	346,649		181,248
Washington	72,504	15,169		15,581	29,119		12,635
Wayne	249,011	50,900	25,147	34,917			138,047
Williams	43,841	14,827					29,014
Wyandot	40,340	20,324	274		1,200	10,758	7,784
Maumee River	56,172				28,086		28,086
TOTAL	16,028,228	3,771,023	1,038,244	1,286,900	7,074,041	79,347	2,778,673



FIGURE 9.—Sales and value of sand and gravel in Ohio. Value line dashed where data not available. 1984 figures include Lake Erie and Maumee River dredged material.

TABLE 22.—1984 Ohio Lake Erie and Maumee River sand and gravel production

Area	Production ¹	
	Cubic yards	Short tons
Lake Erie (all areas produce sand)		
Fairport	63,068	85,142
Maumee Bay	²	
Vermilion-Lorain (Inner)	72,405	97,747
Vermilion-Lorain (Outer)	8,820	11,907
Maumee River		
Sand	67,921	91,694
Gravel	41,609	56,172
TOTAL	253,823	342,662

¹Production reported in cubic yards; converted to tons in the ratio of 1 cubic yard equals 1.35 short tons.

²No production reported for 1984.

SANDSTONE AND CONGLOMERATE

Sandstone and conglomerate were produced at 29 operations in 16 Ohio counties during 1984. Total sales reached 2,152,582 tons, with Geauga, Perry, Ross, Knox, and Mahoning Counties accounting for 83.5 percent of that total. Crushed sandstone and conglomerate totalled 2,015,292 tons, and dimension stone accounted for 137,290 tons of the total sales. Reported known production of sandstone and conglomerate was 1,231,694 tons in 1984.

The value⁸ of sandstone and conglomerate sold in 1984

totalled \$24,488,305, with an average price per ton of \$11.26 for crushed stone and \$31.23 for dimension stone. The overall average price per ton was \$11.38.

An annual average of 292 employees worked an average of 139 days to produce Ohio sandstone and conglomerate, and collected a total of \$5,839,606 in wages. The average annual wage was \$19,999 in 1984. An additional six employees mined sandstone along with one or more other mineral commodities.

Crushed stone was used primarily for foundry sand, glass sand, aggregate, metallurgical pebble, and silica flour. The dimension stone was used primarily for rough construction, rubble, and rough architectural purposes.

⁸Includes reported and estimated values. See footnote 3, p. 12.

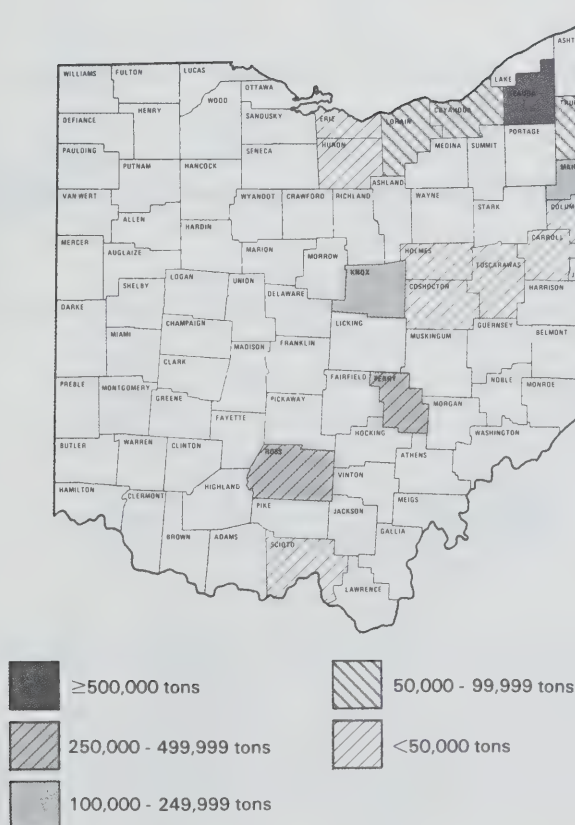


FIGURE 10.—Sales of sandstone and conglomerate in Ohio in 1984, by county.

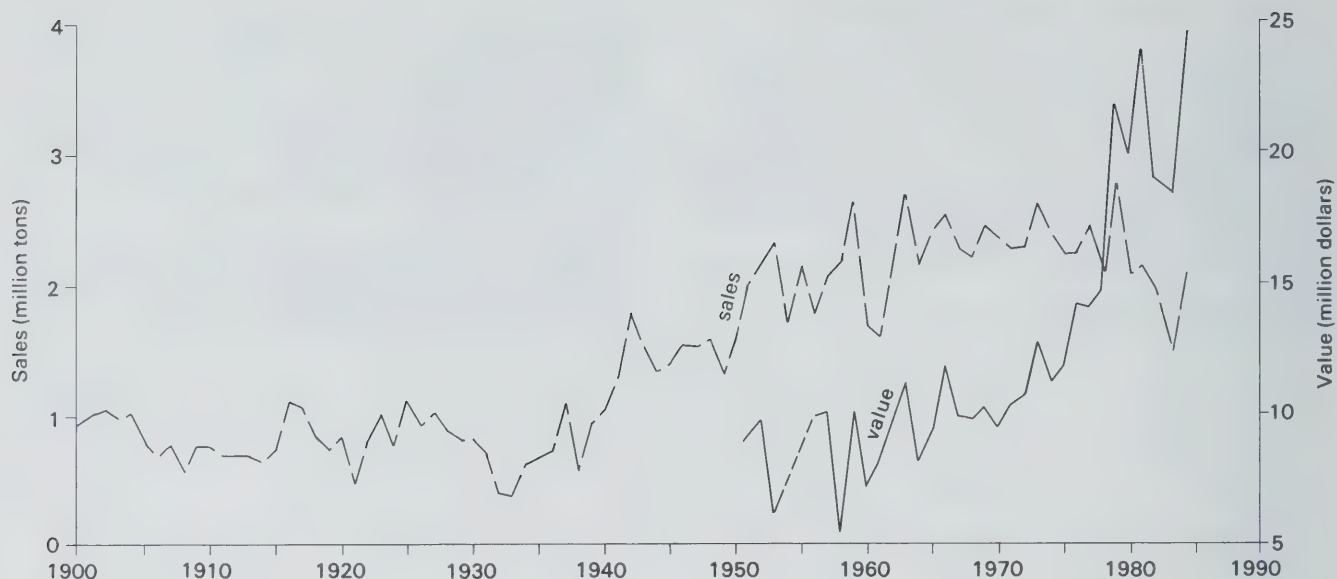


FIGURE 11.—Sales and value of sandstone and conglomerate in Ohio. Value line dashed where data not available.

TABLE 23.—1984 Ohio crushed-sandstone sales, by county and type

County	Tons sold												
	Total	Foundry sand	Glass sand	Metallurgical pebble	Refractory	Riprap	Aggregate	Silica flour	Polishing/grinding sand	Fire and furnace sand	Engine sand	Fracking sand	Other
Columbiana	35,539					571							34,968
Cuyahoga	97,304						97,304						
Erie	1,200					1,200							
Geauga	719,950	256,604	2,965	125,202	26,495	300	61,287		6,000	60,250	90,396	53,900	36,551
Huron	14,167					14,167							
Knox	216,693	18,823	132,250					52,725			6,142	5,026	1,727
Lorain	55,543						55,543						
Mahoning	137,291												137,291
Perry	346,223	49,400	203,885					70,188					22,750
Ross	275,076	89,607	109,287		508		84		1,197		51,091		23,302
Trumbull	69,079						69,079						
Tuscarawas	47,227	1,192								45,855			180
TOTAL	2,015,292	415,626	448,387	125,202	27,003	16,238	283,297	122,913	7,197	106,105	147,629	58,926	256,769

TABLE 24.—1984 Ohio dimension-sandstone sales, by county and type

County	Tons sold									
	Total	Refractory	Rough construction	Rubble	Grindstone	Rough architectural	Finished	Curbing	Flagging	Other
Carroll	302						302			
Coshocton	13,648	1,233				12,415				
Erie	3,970			2,089			1,810	1	70	
Geauga	95,337		35,200							60,137
Holmes	513					513				
Knox	1,091					1,091				
Lorain	13,110			6,939	12		5,912	6	241	
Ross	5,909					2,137				3,772
Scioto	3,410		3,410							
TOTAL	137,290	1,233	38,610	9,028	12	16,156	8,024	7	311	63,909

CLAY

Clay was produced at 35 operations in 18 Ohio counties during 1984. Clay sales (including material for captive use) totalled 867,781 tons, with Tuscarawas, Greene, Paulding, Jackson, and Holmes Counties responsible for 85.3 percent of the total sales. The total value⁹ of clay sold in 1984 was \$4,921,116, with an average price per ton of \$5.67. Reported

⁹Includes reported and estimated values. See footnote 3, p. 12.

known production of clay was 689,779 tons.

An annual average of 33 employees worked an average of 91 days mining only clay to earn total wages of \$351,919 in 1984. The average annual wage, based on those employees for whom wages were reported, was \$13,535. An additional 134 employees mined clay along with one or more other mineral commodities.

Clay mined in Ohio in 1984 was largely for captive use in the production of common clay products, lightweight aggregates, and for cement manufacture.

TABLE 25.—1984 Ohio clay sales, by county and type

County	Tons sold					
	Total	Common clay products	Vitrified products	Refractories	Cement manufacture	Other
Auglaize	3,805	3,805				
Columbiana	1,249	1,249				
Coshocton	5,548	5,548				
Greene	136,901				136,901	
Hocking	14,049		14,049			
Holmes	82,755	82,755				
Jackson	86,734	77,228		9,506		
Lawrence	10,607	852		9,755		
Mahoning	9,285				9,285	
Medina	3,846	3,846				
Muskingum	10,956	6,636	4,320			
Paulding	87,370				87,370	
Perry	3,830	3,830				
Putnam	1,950	1,950				
Scioto	2,500			2,500		
Stark	28,963	155		20,808		8,000
Tuscarawas	346,433	287,383	52,210	5,838		1,002
Wyandot	31,000	31,000				
TOTAL	867,781	506,237	70,579	48,407	233,556	9,002

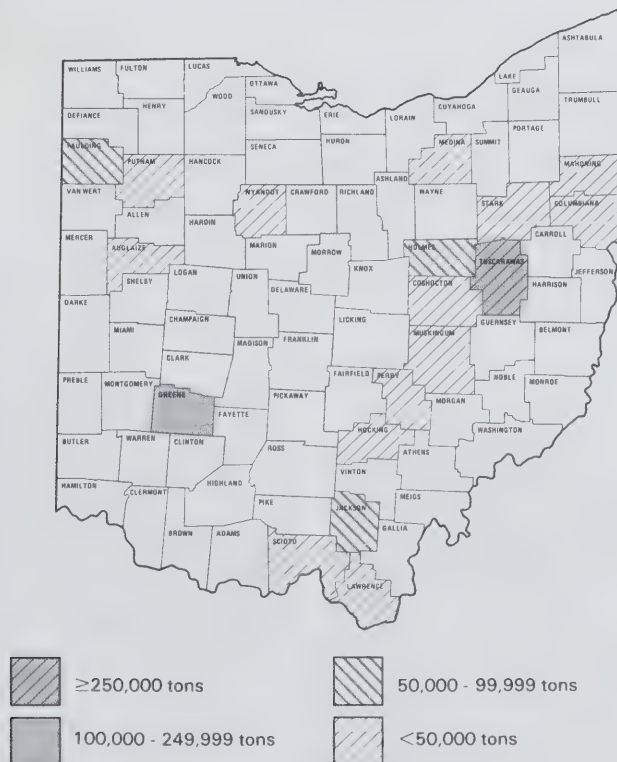


FIGURE 12.—Clay sales in Ohio in 1984, by county.

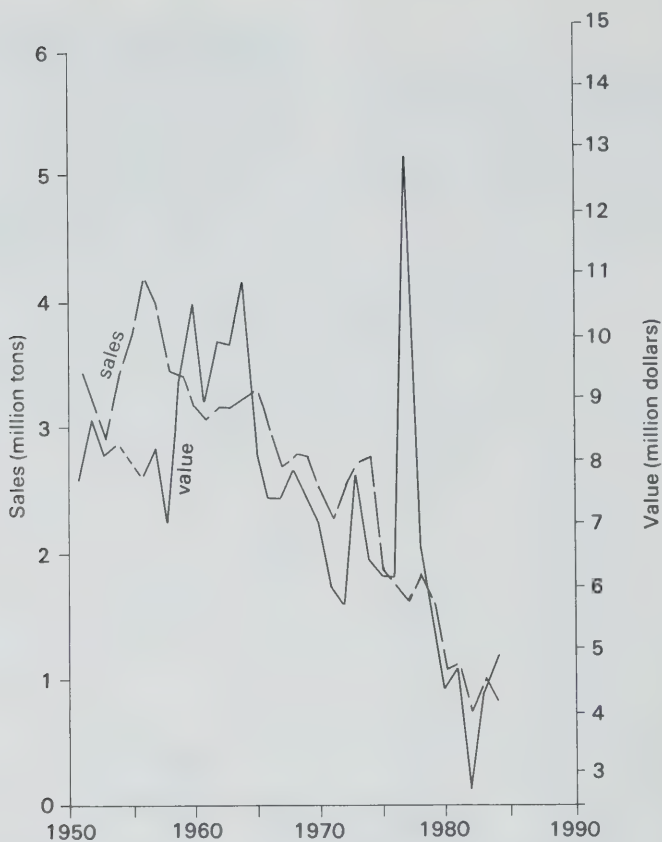


FIGURE 13.—Sales and value of clay in Ohio. Value line dashed where data not available.

SHALE

Shale was produced at 24 operations in 15 Ohio counties during 1984, with production totalling 2,403,659 tons and sales totalling 2,405,166 tons. Franklin, Stark, Tuscarawas, Cuyahoga, and Mahoning Counties were responsible for 85.1 percent of the total sales. The total value¹⁰ of shale sold (including material for captive use) was \$3,130,752, at an

average price per ton of \$1.30.

An annual average of 26 employees worked an average of 136 days mining only shale at an average annual wage of \$14,183, based on those employees for whom wages were reported. Total wages reported for 1984 were \$340,403. An additional 121 employees mined shale along with one or more other mineral commodities.

Shale mined in Ohio in 1984 was largely for captive use in the production of common clay products, for cement manufacture, and in the manufacture of vitrified products.

¹⁰Includes reported and estimated values. See footnote 3, p. 12.

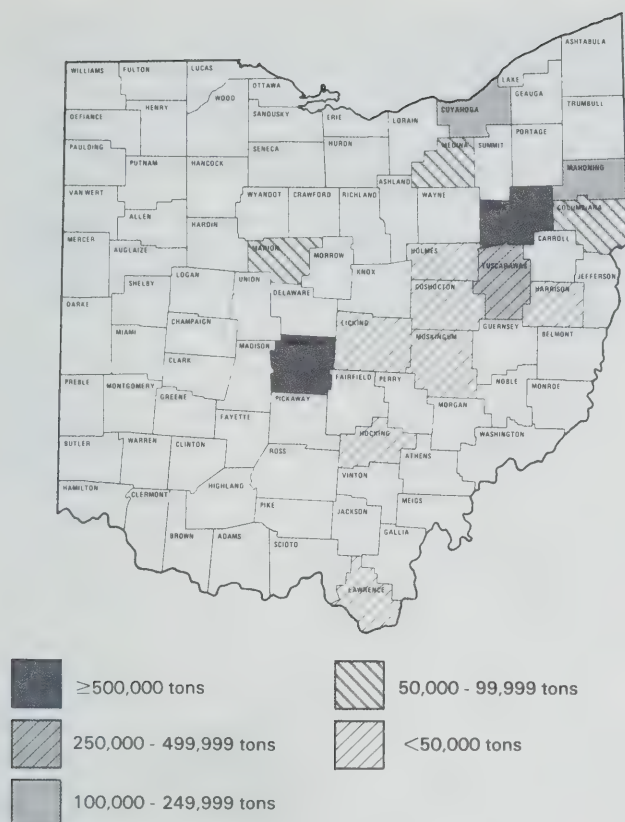


FIGURE 14.—Shale sales in Ohio in 1984, by county.

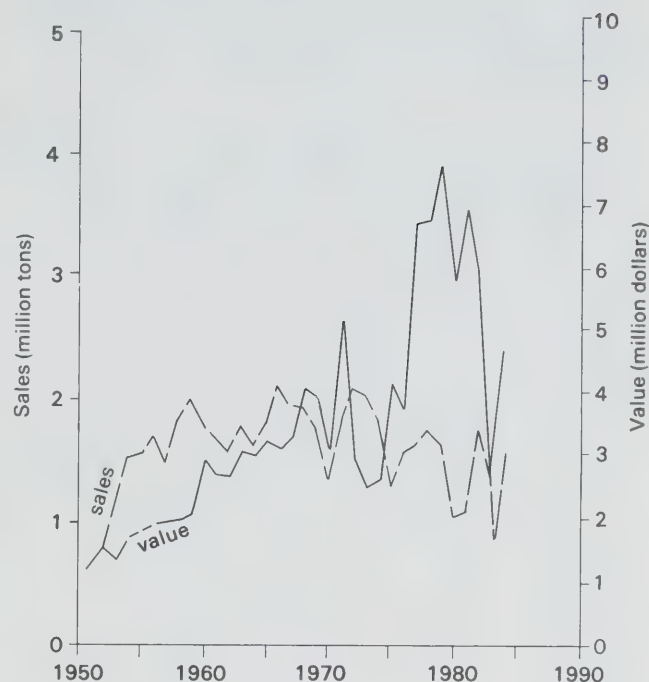


FIGURE 15.—Sales and value of shale in Ohio. Value line dashed where data not available.

TABLE 26.—1984 Ohio shale sales, by county and type

County	Tons sold						
	Total	Common clay products	Glazed ware	Vitrified products	Cement manufacture	Lightweight aggregate	Other
Columbiana	68,737	68,737					
Coshocton	2,544	2,544					
Cuyahoga	166,263					166,263	
Franklin	826,300	496,900					329,400
Harrison	21,300			21,300			
Hocking	12,411			12,411			
Holmes	12,610	12,610					
Lawrence	47,895				47,895		
Licking	24,264			24,264			
Mahoning	134,457				134,457		
Marion	63,279	63,279					
Medina	59,673	59,673					
Muskingum	44,770				44,770		
Stark	612,181		9,181				603,000
Tuscarawas	308,482	301,111		6,452			919
TOTAL	2,405,166	1,004,854	9,181	64,427	227,122	166,263	933,319

GYPSUM

Ohio's gypsum production and sales (including material for captive use) totalled 212,392 tons in 1984, with a reported value¹¹ of \$2,017,724. Average price per ton was \$9.50.

An annual average of 16 employees worked an average of 338 days, with an average annual wage of \$44,694. Total wages reported for 1984 were \$715,111.

SALT

Ohio's salt production totalled 4,123,229 tons in 1984.

¹¹Includes reported and estimated values. See footnote 3, p. 12.

Rock salt was produced from two underground mines, one each in Cuyahoga and Lake Counties, with a total production of 3,489,476 tons. Three brining operations, one each in Licking, Summit, and Wayne Counties, produced a total of 16,444 tons of salt in brine and 617,309 tons of evaporated salt. Total sales of salt in 1984 amounted to 3,824,776 tons with a total value¹¹ of \$35,844,802. Average price per ton was \$9.37 in 1984.

The salt industry had an average of 382 employees working an average of 322 days and earning an average annual wage of \$29,390. Total reported wages for 1984 were \$11,227,035. The primary use for Ohio salt in 1984 was ice control.

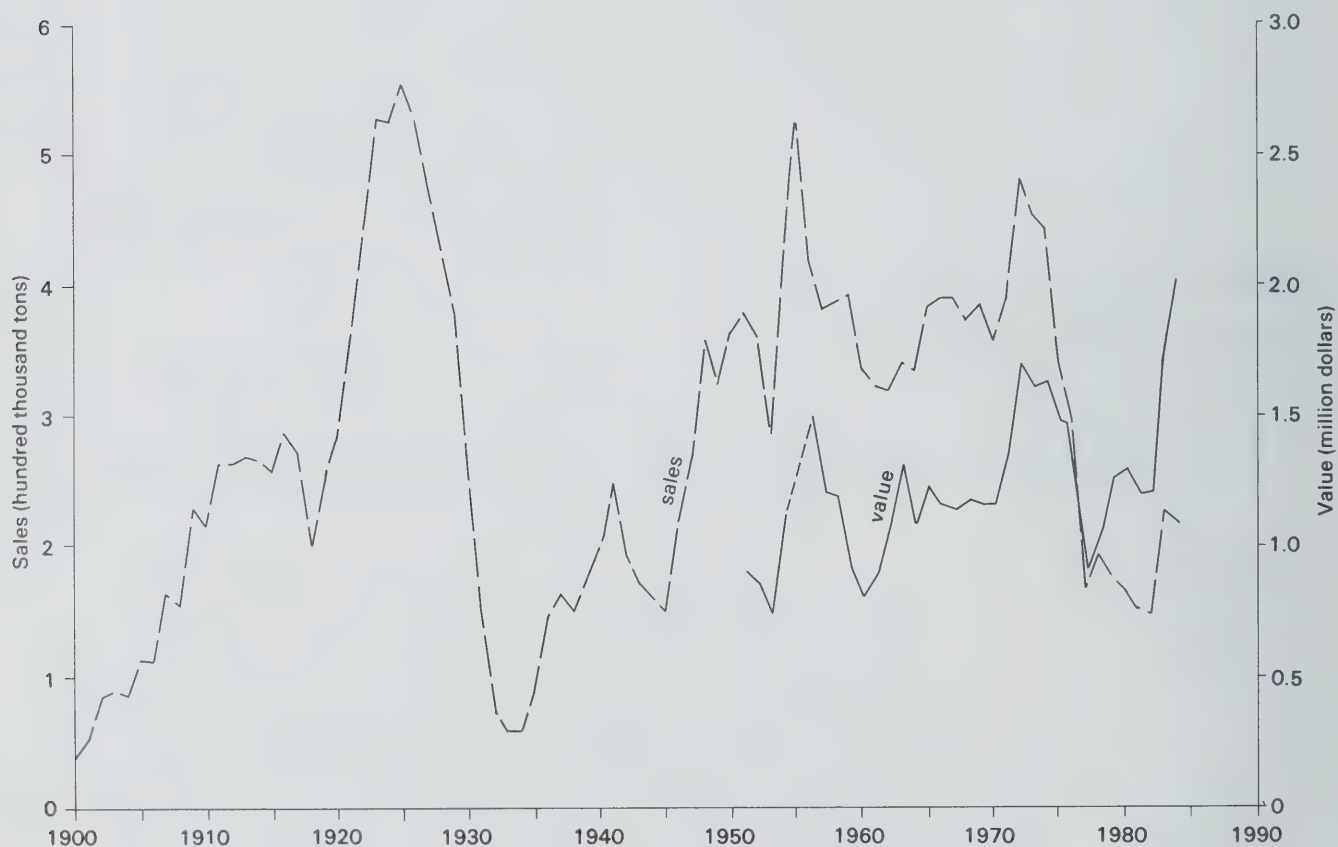


FIGURE 16.—Sales and value of gypsum in Ohio. Value line dashed where data not available. Some figures were calculated because actual figures were not reported in order to maintain confidentiality.

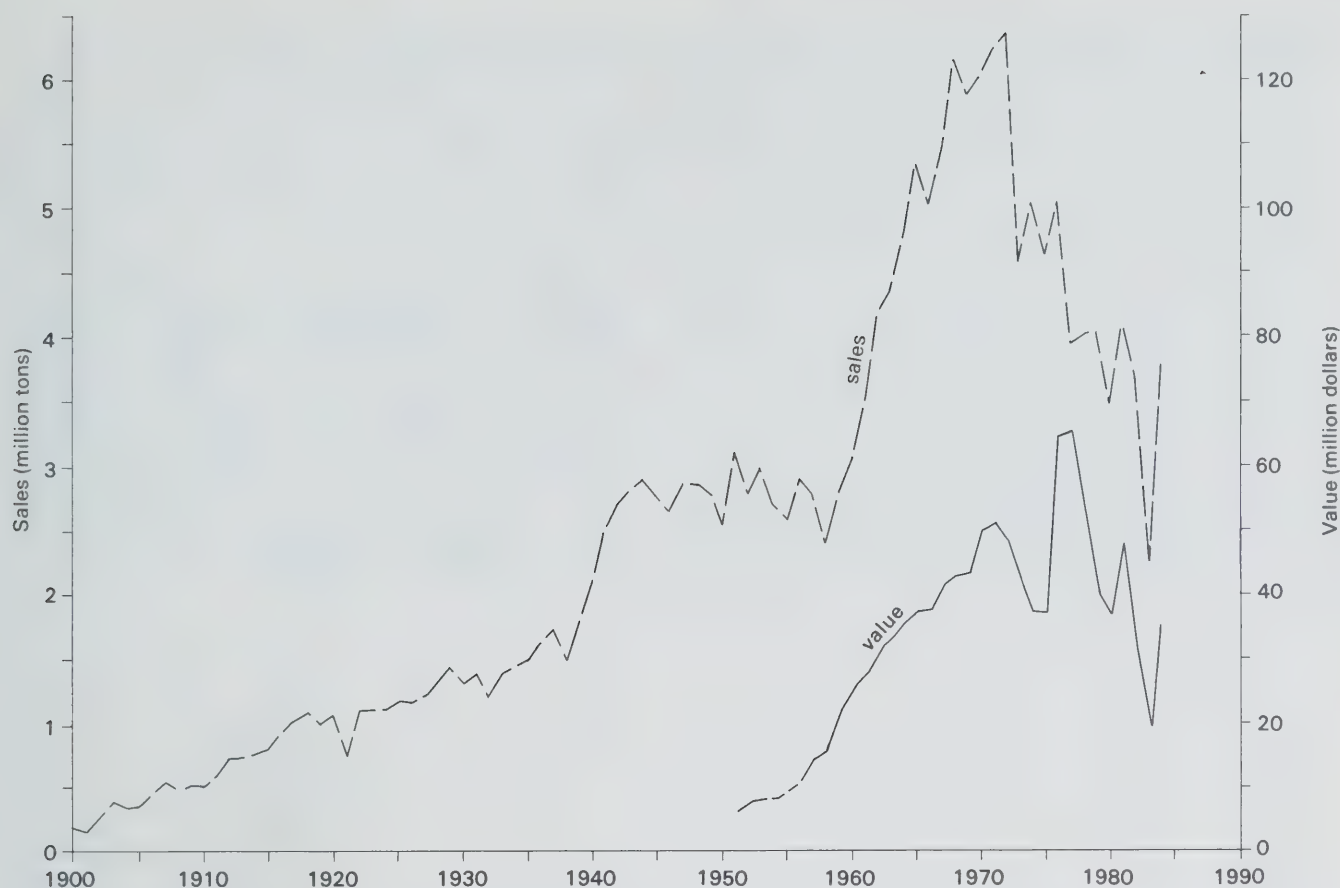


FIGURE 17.—Sales and value of salt in Ohio. Value line dashed where data not available.

PEAT

Peat was produced at five operations in five Ohio counties during 1984. A total of 20,835 tons of peat (including material for captive use) was sold in 1984, with a total value¹² of \$96,199. Average price per ton was \$4.62. Re-

¹²Includes reported and estimated values. See footnote 3, p. 12.

ported known production was 8,967 tons.

An annual average of nine employees earned a total of \$58,219, with an average annual wage of \$6,469. Data were insufficient to calculate the average number of days peat was produced.

Peat produced in Ohio was used for mulch, soil conditioning, worm culture, and legume inoculation.

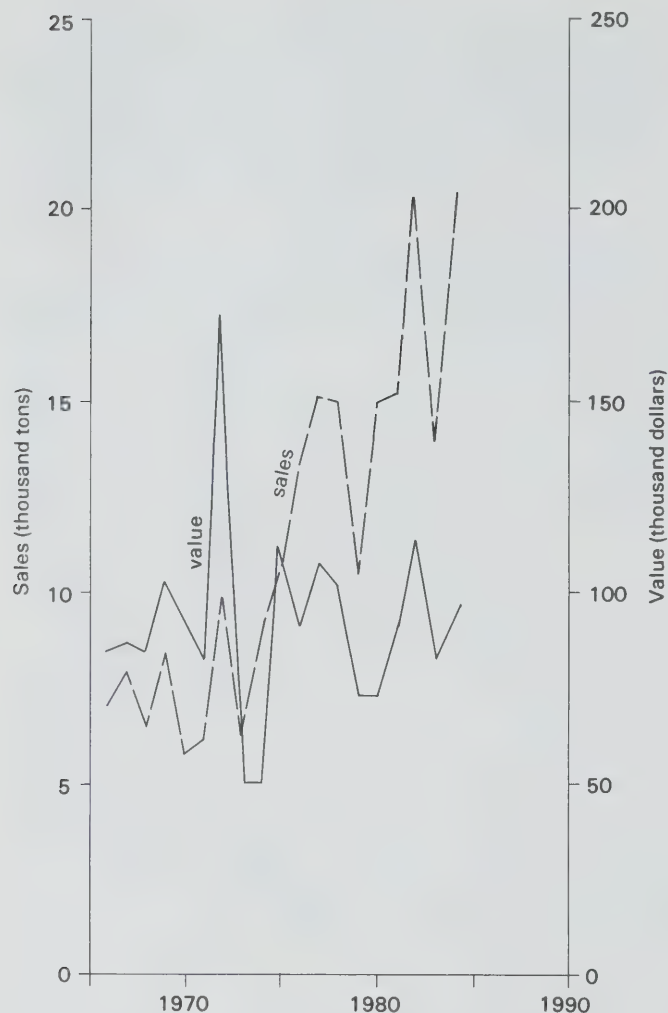


FIGURE 18.—Sales and value of peat in Ohio.

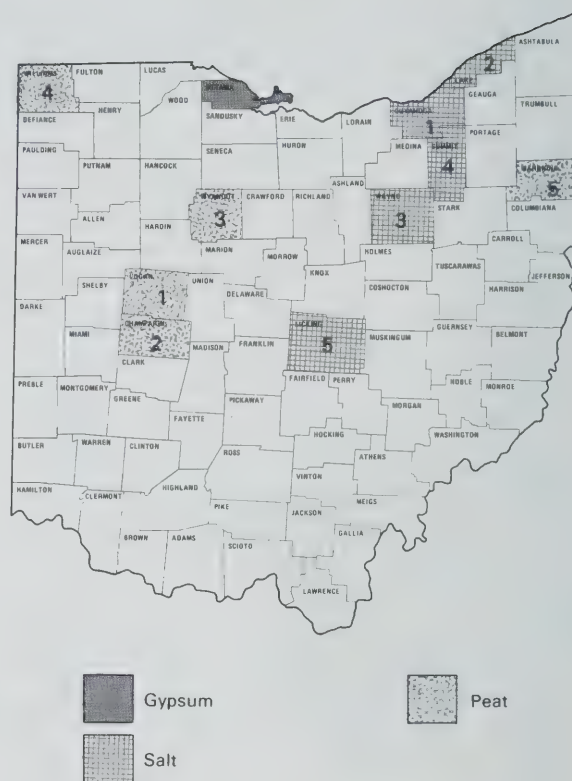


FIGURE 19.—Counties producing gypsum, salt, and peat in Ohio in 1984, and their relative rank.

1984 OHIO OIL AND GAS ACTIVITY

This information on oil and gas is modified from T. A. DeBrosse, 1985, Summary of Ohio oil and gas developments in 1984: Ohio Department of Natural Resources, Division of Oil and Gas

A total of 5,179 drilling operations were reported in Ohio during 1984. This figure represents a 17 percent decrease from the number of drilling operations reported last year, but is still the third-highest number reported in the last decade. In comparing the 1984 list of the 10 most active counties with the 1983 list, we note that four counties failed to reappear on the 1984 list. Licking, Medina, Trumbull, and Wayne Counties have dropped from the list and Ashtabula, Meigs, Summit, and Tuscarawas Counties have been added.

Ashtabula County, with a reported total of 319 new well completions, was the most active county in 1984. In 1983 this county was not in the top 10, although it was ranked tenth in 1982. The reported new well completions in Ashtabula County in 1984 consisted of 86 gas wells, 1 oil well, 220 combination wells, and 12 dry holes. Wells drilled to the

"Clinton" sandstone accounted for all but two of the total new wells reported.

Muskingum County, with a total of 273 reported new well completions, was again the second most active county. All but 19 of the total new wells reported in 1984 were completed in the "Clinton" sandstone.

Third-ranked Perry County, with 266 reported new well completions, dropped from first place in 1983. Fourth-ranked Morgan County, with 252 reported new well completions, rose from sixth place in 1983, and fifth-ranked Coshocton County, with 249 reported new well completions, dropped from fourth place in 1983.

Holmes County, with 242 reported new well completions, was ranked sixth in 1984. Summit County, which did not appear on the 1983 top-10 list, was ranked seventh in 1984

with 232 reported new well completions. Washington County, with 220 reported new well completions, was ranked eighth in 1984. Washington County ranked fifth in 1983.

Tuscarawas County ranked ninth in 1984 with 212 reported new well completions, and Meigs County ranked tenth with 211 reported new well completions; neither of these counties was in the top 10 in 1983. All but five of the new wells reported for Meigs County were completed either in the Berea Sandstone (Mississippian) or the Ohio Shale (Devonian).

The total number of new wells drilled for oil and gas production in 1984 was 4,993, of which 4,621 (92.55 percent) were productive and 372 were dry holes. The productive wells consisted of 1,331 gas wells, 282 oil wells, and 3,008 combination wells. A total of 163 new wells drilled were classified as exploratory wells. The total new-well footage drilled in 1984 was 18,192,031 feet, compared to a total of 21,796,978 feet in 1983. The average depth per new well drilled for oil and gas was 3,644 feet, an increase of 108 feet per well compared to the 1983 average. New "Clinton" wells averaged 4,096 feet in depth.

The total reported oil production in Ohio for 1984 was 15,271,100 barrels. This figure reflects an increase of

300,028 barrels, or 2.06 percent, compared to 1983 production. The dollar value of the crude oil produced in Ohio in 1984 was \$420,048,374, which is \$1,317,074 less than the value of the 1983 production. The average price paid per barrel was \$27.51, a decrease of \$0.64 per barrel from the 1983 price.

Natural gas production in Ohio during 1984 was 186,479,632 MCF. This figure includes an estimated 1,828,232 MCF of gas utilized on the lease. In comparing the total volume of natural gas produced in Ohio in 1984 with the 1983 total, we note an increase of 35,179,773 MCF, or 23.25 percent. The dollar value of the natural gas produced in Ohio in 1984 was \$588,355,065. The value of the estimated volume of gas utilized on the lease was not used in computing this value. The dollar value of 1984 gas production was \$105,584,156 more than the value of 1983 production. The average price paid per MCF was \$3.155, a decrease of \$0.036 per MCF from the 1983 price.

The combined total value of Ohio's 1984 crude oil and gas production was \$1,008,403,439. As of December 31, 1984, there was a total of 55,681 active wells in the state. These wells consisted of 28,657 gas wells and 27,024 oil wells.

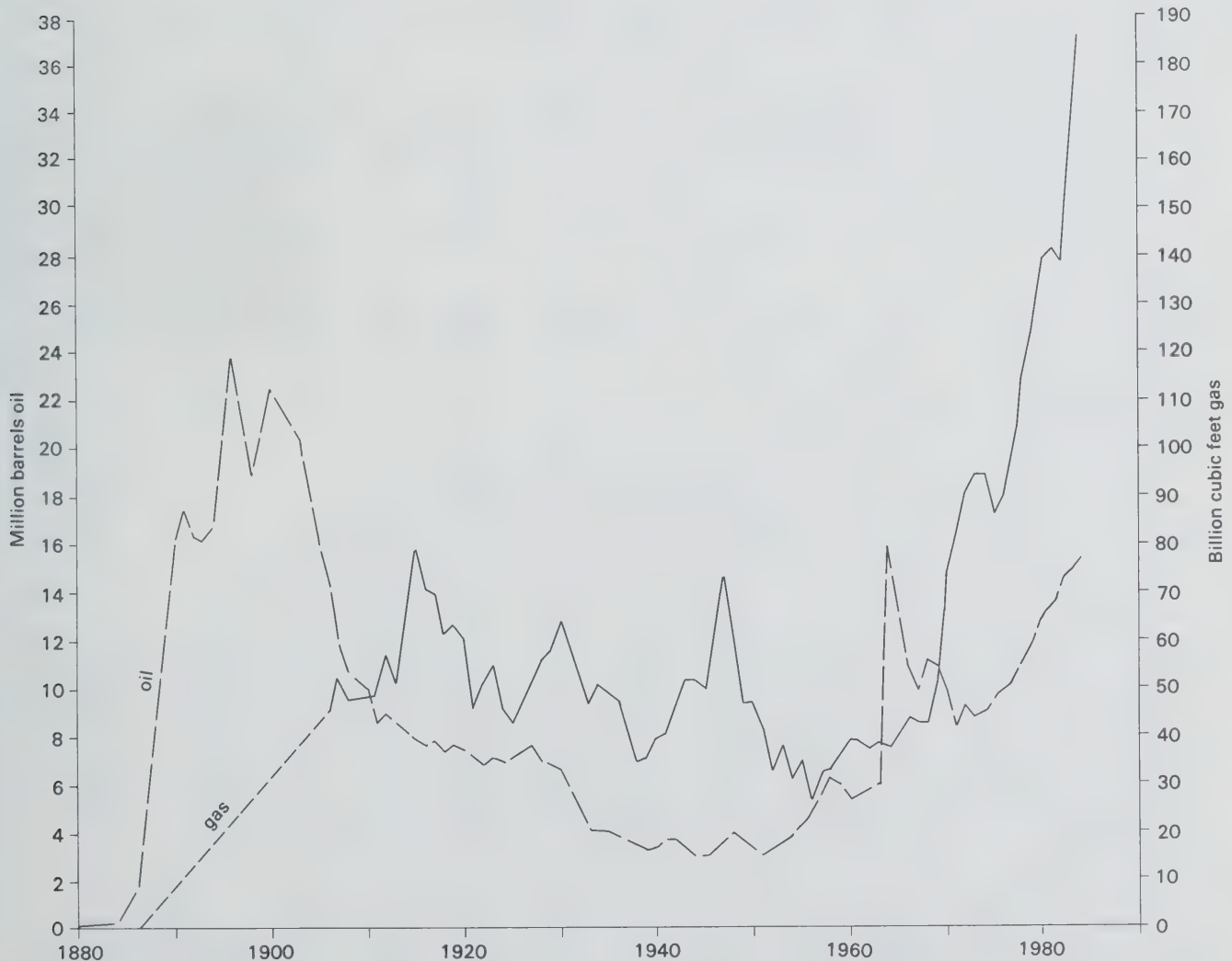


FIGURE 20.—Production of oil and gas in Ohio.

TABLE 27.—1984 Ohio summary of new oil and gas well drilling by county

County ¹	Gas wells			Oil wells			Combination wells				Total producing wells			Dry holes		Total wells	Total footage	Percent productive
	No.	MCFGPD ²	Footage	No.	BOPD ²	Footage	No.	MCFGPD ²	BOPD ²	Footage	No.	MCFGPD ²	BOPD ²	Footage	No.	Footage		
Ashtabula	4	57	7,337	21	65	15,657	17	282	54	19,272	42	339	119	42,266	22	24,274	66	66,540
Ashtabula	86	32,877	294,563	1	5	3,805	220	47,154	585	833,158	307	80,031	890	1,131,526	12	49,651	319	1,191,177
Belmont	24	2,834	65,534	9	30	7,406	49	3,327	439	112,508	82	6,161	469	185,448	13	27,841	86	213,289
Carroll	12	222	61,963														2	7,990
Columbiana	8	1,060	46,109	1	11	995	33	7,496	149	188,941	42	8,556	160	236,045	3	12,534	66	357,705
Coshocton	19	2,328	71,230	56	326	178,962	161	26,315	1,338	553,312	236	28,643	1,664	55,020	1	3,758	239	239,803
Cuyahoga	4	235	10,932				11	960	30	35,093	15	1,195	30	46,025	13	55,020	249	858,524
Delaware	3	235	4,113												3	2,832	16	48,657
Erie	11	1,617	10,152	7	41	18,677	12	755	60	31,458	30	2,372	101	60,287	3	11,326	3	11,326
Fairfield																	3	4,113
Fayette																	31	63,021
Gallia																	1	3,550
Geauga	18	3,685	72,240	2	2	7,931	50	1,201	135	90,950	50	1,201	135	90,950	2	4,625	52	95,675
Greene							151	26,373	419	609,320	171	30,058	421	689,491	9	36,657	180	726,148
Guernsey	65	6,715	373,080				32	8,630	145	170,035	97	15,345	145	543,115	1	1,740	1	1,740
Hancock	2	6	3,275														102	570,649
Hardin	1	50	1,975				29	1,889	122	174,083	80	3,445	122	495,632	5	27,534	4	6,831
Harrison	51	1,556	321,549				1	30	2	1,609	1	30	2	1,609	2	3,275	2	3,275
Henry																	4	6,831
Hocking	7	790	19,052	18	166	55,339	64	2,457	539	197,873	89	3,247	705	272,264	1	1,580	81	497,212
Holmes	35	8,660	140,249	5	123	17,265	190	17,168	1,483	665,733	230	25,828	1,606	823,247	3	8,360	92	280,624
Huron	3	461	2,504	2	255	1,943					5	461	255	4,447	12	33,677	242	856,924
Jefferson	5	37	7,124	1	21	1,300	1	600	10	4,965	2	600	31	6,265	1	1,289	5	8,413
Knox																	6	4,447
Lake	7	455	14,057	21	100	40,488	73	5,907	762	215,428	101	6,362	862	269,973	3	5,907	5	13,861
Lawrence	65	17,569	198,380				10	6,310	23	31,606	75	23,899	23	229,986	23	56,388	124	326,361
Licking	2	97	5,807														1	2,979
Lorain	15	1,065	36,208	44	280	75,808	80	9,805	582	234,393	139	97	0	5,807	1	5,807	76	323,965
Madison	25	3,929	63,586	1	750	2,770	24	1,835	57	68,143	50	5,764	807	346,409	20	40,855	159	387,264
Mahoning	81	34,927	447,824	8	141	43,887	44	5,822	353	287,815	133	40,749	484	779,526	1	2,670	51	137,169
Marion																	134	784,824
Medina	21	2,797	62,573	3	72	3,323	175	15,248	1,245	619,530	199	0	72	3,323	7	5,298	8	3,323
Meigs	147	7,144	486,902	1	14	7,239	57	1,666	165	97,765	205	8,810	166	586,506	11	37,881	210	727,223
Mercer	1	50	1,200								1	50	0	1,200	6	12,311	211	97,16
Monroe																	1	1,200
Morgan	40	5,863	125,472	1	1	2,566	38	3,598	345	113,320	79	9,401	346	241,358	4	10,083	83	251,451
Morrow	99	30,743	475,752	3	17	3,315	137	12,148	749	379,494	239	42,891	766	858,561	13	49,646	252	908,207
Muskingum	1	596	3,904	5	203	17,842	7	1,940	1,688	26,225	13	2,546	1,841	47,971	46	112,633	46	160,604
Noble	47	8,726	190,608	19	204	63,588	175	18,653	809	665,616	241	27,379	1,013	919,812	32	115,472	273	1,035,284
Noble	73	38,269	392,296	1	1,040	6,400	33	2,881	91	139,079	107	41,160	1,131	537,775	1	5,598	108	543,373
Ottawa	3	60	4,180	1	2	1,442	1	100	1	1,345	5	160	3	6,967			5	6,967
Paulding	1	35	1,421				6	1,010	29	8,606	7	1,045	29	10,027			7	10,027
Perry	27	3,115	87,737	28	625	78,340	190	9,860	1,388	616,783	245	12,975	2,013	782,860	21	61,835	266	844,695
Pickaway																	1	3,537
Pike	6	8	5,470								6	8	0	5,470	1	5,470	6	5,470
Portage	21	6,006	62,379				113	15,427	1,118	500,437	134	21,433	1,118	562,816	8	32,857	142	595,673
Putnam																	1	1,360
Sandusky							1	1	18	1,299	1	1	18	1,299	1	1,360	1	1,360
Seneca	7	15	6,782								7	15	0	6,782	1	975	8	1,299
Shelby																	1	7,757
Stark	6	158	8,304														3	6,012
Summit	5	577	21,983	3	114	14,253	105	7,449	1,155	514,625	6	158	0	8,304	2	3,044	8	11,348
Trumbull	10	1,000	39,724				219	41,846	1,176	888,027	113	8,026	1,269	560,861	1	5,005	114	555,866
Tuscarawas	56	55,125	286,318	1	19	4,220	81	28,603	379	347,040	138	42,846	1,176	907,751	3	31,084	232	919,301
Tuscarawas	75	10,851	383,442	2	202	10,987	130	15,418	737	661,641	207	26,269	939	1,056,070	5	14,986	146	649,262
Union																	212	1,071,056
Van Wert	1	100	1,277	1	2	1,261											3	10,275
Vinton	7	2,936	20,659	3	19	6,882	8	671	89	17,092	2	100	2	2,538	3	10,275	3	10,275
Washington	93	10,814	251,104	6	15	6,678	114	8,511	515	262,336	18	3,607	108	44,573	2	2,532	4	5,070
Wayne	27	3,955	99,160	2	3	12,060	114	9,076	629	401,266	213	19,325	530	520,118	8	16,288	26	63,529
Wood																	31	107,079
Wyandot	2	2	2,300	4	43	4,910					6	2	43	7,210	3	8,347	9	15,557
TOTAL	1,331	310,612	5,287,780	282	4,912	719,378	3,008	370,208	20,993	11,053,175	4,621	680,820	25,905	17,060,333	372	1,131,698	4,993	18,192,031

¹The following counties reported no wells drilled in 1984: Adams, Allen, Auglaize, Brown, Butler, Champaign, Clark, Clermont, Clinton, Crawford, Darke, Defiance, Franklin, Fulton, Hamilton, Highland, Logan, Lucas, Madison, Miami, Montgomery, Preble, Richland, Ross, Warren, and Williams.

²MCFGPD, thousand cubic feet of gas per day; BOPD, barrels of oil per day.

TABLE 28.—1984 Ohio summary of new oil and gas well drilling by producing zone

Producing zone	No. of producing wells	No. of dry holes	Total no. of wells	Total footage	Percent productive
Pennsylvanian undifferentiated	25	10	35	23,465	71.43
Upper Mississippian undifferentiated	13	3	16	22,471	81.25
Lower Mississippian "1st & 2nd Berea"	545	71	616	895,542	88.47
Devonian					
Ohio Shale	318	11	329	1,037,274	96.66
"Big Lime"	7	0	7	7,708	100.00
Oriskany	10	2	12	40,190	83.33
Silurian					
"Newburg"	2	1	3	10,177	66.67
"Clinton-Medina"	3,648	202	3,850	15,772,646	94.75
Lower Ordovician					
Trenton-Rose Run	37	17	54	133,782	68.52
Cambrian undifferentiated	16	49	65	229,158	24.62
Precambrian	0	6	6	19,618	00.00
TOTAL	4,621	372	4,993	18,192,031	92.55

TABLE 29.—Ohio new well completions¹, 1974-1984

Year	Gas wells		Oil wells		Combination wells		Dry holes		Total wells
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
1974	768	43.49	247	13.99	584	33.07	167	9.46	1,766
1975	417	34.18	208	17.05	480	39.34	115	9.43	1,220
1976	816	42.14	213	11.00	743	38.37	164	8.47	1,936
1977	844	32.16	372	14.18	1,237	47.14	171	6.52	2,624
1978	844	32.39	273	10.47	1,273	48.85	216	8.29	2,606
1979	1,097	31.86	251	7.29	1,927	55.97	168	4.88	3,443
1980	818	24.37	276	8.22	2,154	64.18	108	3.22	3,356
1981	1,256	23.15	394	7.26	3,419	63.02	356	6.56	5,425
1982	1,095	23.59	317	6.83	2,901	62.49	329	7.09	4,642
1983	1,601	25.96	471	7.63	3,664	59.43	429	6.95	6,165
1984	1,331	26.65	282	5.64	3,008	60.24	372	7.45	4,993

¹Does not include wells reopened, gas-storage wells, or secondary-recovery or service wells.

TABLE 30.—*Ohio crude oil and gas production and reserves, 1974-1984*

Year	Oil		Gas	
	Production (thousand barrels)	Reserves ¹ (thousand barrels)	Production (thousand MCF)	Reserves (thousand MCF) (exclusive of storage)
1974	9,088	123,871	94,376	960,662
1975	9,578	121,263	85,810	969,020
1976	9,994	125,268	89,770	1,025,950
1977	10,359	129,148	99,656	1,093,150
1978	11,154	131,194	115,239	1,177,511
1979	11,953	137,718	124,665	1,313,333
1980	12,928	116,000 ²	138,856	1,436,629
1981	13,551	112,000 ²	141,134	1,689,745
1982	14,571	111,000 ²	138,391	1,730,691
1983	14,971	130,000 ²	151,300	1,557,708
1984	15,271	²	186,480 ³	1,405,681

¹Based on data from American Petroleum Institute.²Based on data from U.S. Department of Energy, Energy Information Administration. 1984 figure not available.³Included in this total is an estimated 1,828,232 MCF of gas utilized in the field.TABLE 31.—*1984 Ohio mineral-producing counties¹ and their Division of Mines abbreviations²*

County	Abbreviation	County	Abbreviation	County	Abbreviation
Adams	Ads	Hancock	Hk	Paulding	Pg
Allen	An	Hardin	Hdn	Perry	Py
Ashland	Ald	Harrison	Hn	Pickaway	Pky
Ashtabula	Asa	Henry	Hy	Pike	Pke
Athens	As	Highland	Hd	Portage	Pe
Auglaize	Ae	Hocking	Hg	Preble	Pre
Belmont	Bt	Holmes	Hs	Putnam	Pm
Brown	Bn	Huron	Hrn	Richland	Rd
Butler	Br	Jackson	Jkn	Ross	Rs
Carroll	Cl	Jefferson	Jfn	Sandusky	Sy
Champaign	Cpn	Knox	Kx	Scioto	So
Clark	Ck	Lake	Lke	Seneca	Sa
Clermont	Ct	Lawrence	Le	Shelby	Shy
Clinton	Cln	Licking	Lg	Stark	Sk
Columbiana	Ca	Logan	Lgn	Summit	St
Coshocton	Cn	Lorain	Ln	Trumbull	Tl
Crawford	Cd	Lucas	Ls	Tuscarawas	Ts
Cuyahoga	Cya	Mahoning	Mg	Union	Un
Darke	Dke	Marion	Mn	Van Wert	Vt
Defiance	De	Medina	Ma	Vinton	Vn
Delaware	Del	Meigs	Ms	Warren	Wan
Erie	Ee	Mercer	Mr	Washington	Wn
Fairfield	Fd	Miami	Mi	Wayne	We
Fayette	Fe	Monroe	Me	Williams	Ws
Franklin	Fn	Montgomery	My	Wood	Wd
Gallia	Ga	Morgan	Mon	Wyandot	Wt
Geauga	Gea	Morrow	Mw		
Greene	Ge	Muskingum	Mum		
Guernsey	Gy	Noble	Ne		
Hamilton	Hmn	Ottawa	Oa		

¹Fulton and Madison Counties produced no mineral commodities during 1984.²As used for Division of Mines mine numbers.

1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
Adams Coal Co. 46 Vaughn St. Jackson, OH 45640 614-286-1063	Adams Pit	Jackson	3,958	Jkn-556	D-0260
Anthony Mining Co., Inc. P.O. Box 1298 Steubenville, OH 43952 614-282-7811	Island Creek #43 Pipo #51 Maine 307	Jefferson Jefferson Jefferson	56,390 52,601 63,498	Jfn-693 Jfn-788 Jfn-789	C-1141, C-1349 D-0327 D-0307
Arapaho Mining, Inc. P.O. Box 542 New Philadelphia, OH 44663 216-343-4478	Arapaho Mining, Inc.	Tuscarawas	58,335	Ts-1921	D-0103, D-0375
Arrow Head Energy, Inc. P.O. Box 231 Gnadenhutzen, OH 44629 614-922-3743	Arrow Head Strip Post Boy 101	Tuscarawas Tuscarawas	106,139 2,725	Ts-1890 Ts-1912	D-0097, D-0418 IM-782, D-0484
B & D Coal, Inc. P.O. Box 134 Hamden, OH 45634 614-384-3404	B & D Coal #2 B & D Coal #1	Jackson Vinton	36,288 64,168	Jkn-570 Vn-623	D-0207 C-0993, D-0294
B & N Coal Co. P.O. Box 100 Dexter City, OH 45727 614-783-3575	Orange Strip B & N Coal Broom's Run	Noble Noble Washington	161,262 170,637 251,520	Ne-137 Ne-138 Wn-51	
Bannock Coal Co. 43249 Harrah St. P.O. Box 98 Lafferty, OH 43951 614-968-4211	Michelena	Belmont	367,054	Bt-133	
Bask Coal Co. 3519 Miles Ave. NW Canton, OH 44626 216-492-2241	Brad	Stark	2,069	Sk-224	D-0100
Belden Brick Co. P.O. Box 910 Canton, OH 44701 216-852-2424	Finzer-Belden	Tuscarawas	2,243	Ts-1646	IM-44
Belville Mining Co., Inc. P.O. Box 309 Wheelersburg, OH 45694 614-574-8464	Brady Creek #1	Lawrence	118,828	Le-432	D-0107
Benedict, Inc. P.O. Box 315 McArthur, OH 45651 614-596-5226	Benedict, Inc. Benedict, Inc.	Vinton Vinton	47,076 21,540	Vn-13 Vn-654	C-1322 C-1194
Bennoc, Inc. P.O. Box 208 Morristown, OH 43759 614-782-1330	Quaker City	Noble	39,881	Ne-136	C-1154
Bluff Hill Coal Co. P.O. Box 50 A Gnadenhutzen, OH 44629 614-254-9295	Bluff Hill Coal Co. Bluff Hill Coal Co.	Tuscarawas Tuscarawas	4,176 7,485	Ts-1893 Ts-1949	C-1410 D-0394
Blum Coal Co. Scio-Carrollton Rd. P.O. Box 232 Carrollton, OH 44615-0232 216-627-5232	Guilford Lake Job	Columbiana	46,666	Ca-B ¹	D-0039
Boich Mining Co. P.O. Box 148 Bloomingtondale, OH 43910 614-733-7311	Betsey Mine	Jefferson	346,156	Jfn-528	C-1498, D-0247
The Boyle Coal Co. P.O. Box 3 New Straitsville, OH 43766 614-394-2747	Boyle Strip	Hocking	18,737	Hg-253	C-0400, C-1031, C-1222
Buckeye Coal Mining Co., Inc. P.O. Box 1 Lisbon, OH 44432 216-424-7281	Buzzard Pit Mick Pit Boyd Pit	Columbiana Columbiana Columbiana	35,546 34,740 20,084	Ca-240 Ca-864 Ca-912	D-0017 C-1381 D-0385

¹No mine number has been assigned by the Division of Mines.

1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS—Continued

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
Burning Hollow Coal Co. P.O. Box 88 Gnadenhutzen, OH 44629 614-254-4328	Garaux Strip #2	Stark Tuscarawas	79,592 39,523	Sk-215 Ts-1932	
C & E, Inc. R.D. 2 Box 177 Toronto, OH 43964 614-537-1498	C & E, Inc.	Columbiana	7,409	Ca-921	D-0528
C & W Mining Co. 11478 State Rte. 45 Lisbon, OH 44432 216-424-9501	C & W Strip #2	Columbiana	16,169	Ca-875	C-1453
C K & K, Inc. R.D. 4 Box 4600 New Philadelphia, OH 44663 614-922-0797	C K & K, Inc.	Harrison	69,147	Hn-208	D-0245
Cardinal Mining, Inc. 4014 Butler-Grange Rd. Salem, OH 44460 216-222-1487	Cardinal Strip	Mahoning	27,067	Mg-624	D-0271
Central Mining Co. 6950 State Rte. 164 Lisbon, OH 44432 216-424-3938	Ullom Mine	Columbiana	2,733	Ca-904	D-0144
Central Ohio Coal Co. P.O. Box 98 Cumberland, OH 43732 614-962-2013	Muskingum Mine	Muskingum, Noble	3,328,587	Ne-41	D-0056, D-0127, D-0261, D-0274
Coalbrook Mining Co. 42891 Kelly Park Rd. Columbiana, OH 44408 216-482-2365	Toth Strip	Columbiana	24,102	Ca-765	D-0129
Commercial Minerals, Inc. 10900 South Ave. P.O. Box 217 North Lima, OH 44452 216-424-1463	"C" Mine West Point	Columbiana Columbiana	55,103 16,419	Ca-829 Ca-919	
Consolidation Coal Co. Eastern Region Cadiz, OH 43907 614-942-4641	Franklin #125 Oak Park #007 Mahoning Valley #033	Harrison Harrison Belmont, Harrison	623,241 955,644 1,054,168	Hn-203 Hn-658 Hn-700	D-0174, D-0323 D-0357 D-0030, D-0054, D-0334
Cravat Coal Co. 40580 Cadiz-Piedmont Rd. Cadiz, OH 43907 614-942-4656	Dover-Kriechbaum Malcuit #2 2400 #1 Hendrysburg Flushing #9 Loase-Sawyer Krulock Coshocton Bloomfield Loase-Patton Rix Mills	Belmont Belmont Belmont Belmont Belmont Belmont Belmont Coshocton Muskingum Muskingum Muskingum	19,969 67,993 73,870 136,550 258,036 3,239 13,373 40,760 42,719 46,219 13,667	Bt-78 Bt-143 Bt-146 Bt-147C ² Bt-967 Bt-982 Bt-998 Cn-766 Mum-244 Mum-249 Mum-887	C-0992, C-1565 C-1006 D-0299 D-0299
Crawford Coal Co. 605 W. Lincoln Way Lisbon, OH 44432 216-424-7366	Crawford Coal Co.	Columbiana	23,218	Ca-827	
Crooksville Coal Co. P.O. Box 149 Crooksville, OH 43731 614-697-7064	Crooksville Strip	Perry	424,694	Py-317	D-0057, D-0085
Crown City Mining, Inc. 6422 E. Main St. Reynoldsburg, OH 43068 614-866-6505	Crown City Mine	Gallia, Lawrence	472,644	Ga-220	C-0758, C-1247, C-1390, C-1486, D-0092, D-0123, D-0201, D-0221, D-0279
D & D Mining Co. 3379 E. Garfield Rd. New Springfield, OH 44443 216-549-3127	Jack Foster Pit John Foster Pit Dickson Pit Lyons Pit	Columbiana Columbiana Columbiana Columbiana	4,805 29,430 15,448 4,336	Ca-872 Ca-885 Ca-888 Ca-891D ²	C-0744 C-0137 C-1258, D-0379 D-0032
D & J Energy, Inc. Rte. 1 Box 351 Bidwell, OH 45614 614-384-2614	D & J Energy, Inc.	Jackson	22,912	Jkn-583	IM-894

²This mine number has been duplicated for another company.

1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS—Continued

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
D & L Contractors, Inc. P.O. Box 446 Flushing, OH 43977 614-968-4913	D & L Strip	Jefferson	65,514	Jfn-780	D-0126
Daft Coal Co. P.O. Box 93 McArthur, OH 45651 614-596-4127	Daft Coal	Hocking	31,696	Hg-312	D-0147
Daron Coal Co. 3335 Steubenville Rd. SE Carrollton, OH 44615 216-739-5011	Harstine	Tuscarawas	134,842	Ts-1924	D-0080
Dolen Excavating 3265 East Pike Zanesville, OH 43701 614-453-2819	Dolen Excavating	Muskingum	4,720	Mum-247	D-0187
Joe Dudek Coal Mining Co. 46433 Crabapple Rd. St. Clairsville, OH 43950 614-968-3359	Dudek #2	Belmont	10,331	Bt-616	C-1188
East Fairfield Coal Co. 10900 South Ave. P.O. Box 217 North Lima, OH 44452-0217 216-549-2165	"F" Mine "W" Mine "K" Mine	Columbiana Columbiana Mahoning	24,074 92,682 94,534	Ca-344 Ca-894 Mg-603	D-0364 D-0041 C-1452
East Ohio Limestone Co. P.O. Box 25 Hartsville, OH 44632 216-877-2636	East Ohio Limestone	Stark	6,863	Sk-663	IM-5
Eberhart Coal, Inc. 6406 Cleveland Ave. S East Sparta, OH 44626 216-484-4261	Eberhart #2-Hott Strip Eberhart #2-Hott Strip Eberhart #2-Hott Strip Eberhart #2-Hott Strip	Tuscarawas Tuscarawas Tuscarawas Tuscarawas	41,568 32,485 17,925 57,781	Ts-1526 Ts-1620 Ts-1882 Ts-1919	C-1195, D-0330 D-0218 D-0013 D-0075
Eberts Coal Co., Inc. P.O. Box 66 Hamden, OH 45634 614-384-3784	Quarry Mine	Vinton	56,362	Vn-163	D-0210
Elk Coal Co., Inc. P.O. Box 165 McArthur, OH 45651 614-596-5520	Bowling Strip Elk Strip	Jackson Vinton	74,585 8,327	Jkn-576 Vn-164	D-0204 D-0083, D-0366
Empire Coal Co. P.O. Box 729 Gnadenhutzen, OH 44629 614-254-4395	Empire Pit	Tuscarawas	320,757	Ts-115	C-1467, D-0190, D-0199, D-0217, D-0341
ENZ, Inc. Rte. 1 Box 444 Dover, OH 44622 216-364-8621	Ervin Strip & Sickafoose Pit	Stark	116,606	Sk-208	IM-822, IM-861, D-0295
F & M Coal Co. Box 171 Costonia Rd. Toronto, OH 43964 614-544-5203	E & E Strip	Jefferson	26,622	Jfn-784	D-0091
Fairpoint Coal Co. P.O. Box 158 Fairpoint, OH 43927 614-695-3174	Mel-Worth	Belmont	32,878	Bt-927	C-1475
Ferris Coal Co., Inc. 371 South St. East Palestine, OH 44413 216-426-9680	7400 Mine Guilford Mine	Columbiana Columbiana	75,960 4,213	Ca-154 Ca-784	D-0040 D-0161
Franklin Coal Co. 329 W. 3rd St. Dover, OH 44622 216-343-2124	Brown	Harrison	14,505	Hn-215	D-0349
G & M Mineral Co. P.O. Box 345 Berlin, OH 44610 216-893-2721	G & M Mineral Co.	Coshocton	58,115	Cn-757	C-1426
Getz Coal Sales, Inc. 8310 Hoffee Rd. Lisbon, OH 44432 216-222-1221	Getz Coal Sales, Inc.	Columbiana	3,476	Ca-G ³	D-0200

³No mine number has been assigned by the Division of Mines.

1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS—Continued

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
GEX Hardy, Inc. P.O. Box 340 Sugarcreek, OH 44681 216-852-2431	Flushing Blue Valley Stonecreek Ragersville	Belmont Tuscarawas Tuscarawas Tuscarawas	438,604 54,675 25,845 99,960	Bt-977 Ts-1880 Ts-1929 Ts-1946	C-1472 C-1066 D-0084 D-0335
Gofer Mining Co. Rte. 4 Box 138 Gallipolis, OH 45631 614-446-0237	Newt #2	Jackson	68	Jkn-580	
Goshen Coal Co. 323 Monroe St. Dover, OH 44622 216-343-2124	Wardell	Tuscarawas	52,330	Ts-1922	D-0109
Green & Burritt Coal Co. P.O. Box 422 Wellston, OH 45692 614-384-5780	Green Strip	Gallia	49,956	Ga-242	C-1326, D-0226
Hanover Coal Co. P.O. Box 134 Hanoverton, OH 44423 216-223-1392	Burchfield Strip #3	Columbiana	30,493	Ca-339	D-0232
Hillcrest Coal, Ltd. 190 S. Main St. Magnolia, OH 44643 216-866-9388	Hillcrest Coal Hillcrest Coal	Stark Stark	15,489 10,813	Sk-196 Sk-221	C-1425, D-0381 C-1551, D-0380
Holmes Limestone Co. P.O. Box 295 Berlin, OH 44610 216-893-2721	Charm Mine 241 Plant Wayne Mines Farmerstown Pit Cherry Ridge Pit Sugarcreek Pit Wilmot Pit Stanwood Pit	Holmes Holmes Holmes Holmes Holmes Holmes Stark Stark	9,540 19,913 39,952 81,767 147,025 5,366 20,200 39,515	Hs-64 Hs-67 Hs-79 Hs-80 Hs-86 Hs-H ⁴ Sk-216 Sk-227	C-1471 IM-3, IM-768 IM-656 C-1505, C-1522, D-0377 D-0193 D-0402 C-1485 D-0384
Horizon Coal Corp. P.O. Box 618 Beach City, OH 44608 216-756-2414	Horizon Strip-Canton Horizon Strip-Belden	Stark Tuscarawas	163,982 167,212	Sk-223 Ts-1941	D-0087 D-0224
Hutson Road Mining Co. 1200 W. South Range Rd. North Lima, OH 44452 216-549-5214	Hutson Road Mining Co. Hutson Road Mining Co.	Columbiana Columbiana	5,131 1,517	Ca-336 Ca-917	C-1312, D-0391 D-0391
Hutt Coal Co. 22375 County Rd. 1A Coshocton, OH 43812	Hutt Coal Co.	Coshocton	3,608	Cn-804	D-0191
Industrial Mining Co. P.O. Box 1 Lisbon, OH 44432 216-337-9511	Blade Pit R & R Job Burns Pit Rogers Trares Industrial Mining Co. Industrial Mining Co.	Carroll Carroll Carroll Columbiana Columbiana Columbiana Jefferson	50,997 27,046 45,936 73,032 50,067 19,672 1,639	Cl-219 Cl-220 Cl-223 Ca-850 Ca-907 Ca-909 Jfn-1286	C-1494 D-0284 D-0406 D-0052 D-0164 D-0164 D-0010
J & D Mining Co. Rte. 4 Box 4229A New Philadelphia, OH 44663 216-339-4900	Demuth Pit	Tuscarawas	40,157	Ts-1915	C-1292, D-0172
James Bros. Coal Co. 190 S. Main St. Magnolia, OH 44643 216-866-9388	7400 Pit 9W Pit	Carroll Carroll	68,683 53,579	Cl-17 Cl-162	C-1232, D-0282 C-1155, C-1405, D-0408
Jeffco Sales & Mining Co. 2127 Margaret St. Steubenville, OH 43952 614-282-5929	McCormicks Run	Columbiana	9,963	Ca-895	D-0104
Jefferson Holding, Inc. R.D. 1 Bergholz, OH 43908 614-768-2272	Elkhorn Strip	Jefferson	4,378	Jfn-1277	C-0750, D-0099
Johnson Mining Co. 39150 Churchill Rd. Lisbon, OH 44432 216-424-5113	Johnson Mining	Columbiana	26,817	Ca-893	
Joyce Coal Co. P.O. Box 624 St. Clairsville, OH 43950 614-782-1330	Crescent-Andys	Belmont	10,430	Bt-980	

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1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS—Continued

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
K & R Enterprises, Inc. P.O. Box 247 Canfield, OH 44406 216-533-9803	R-3 Foltz	Columbiana Stark	80,797 199,099	Ca-836 Sk-225	D-0043 D-0105
K D Coal Co., Inc. 3379 E. Garfield Rd. New Springfield, OH 44443 216-549-3979	Baker Mine	Columbiana	12,263	Ca-343	C-1571, D-0372
King Quarries, Inc. 2215 Adamsville Rd. Zanesville, OH 43701 614-453-9961	King Strip King Strip King Strip King Strip King Strip	Muskingum Muskingum Muskingum Muskingum Muskingum	4,706 41,738 49,758 6,896 14,657	Mum-225 Mum-237 Mum-246 Mum-251 Mum-886	C-1356 C-1579, D-0269 C-1224, D-0362 D-0382 C-1177, C-1233
Kohl Industries Rte. 4 New Philadelphia, OH 44663 216-874-4748	Black Hawk Mine	Stark	149,547	Sk-217	IM-750
Krulock, Inc. P.O. Box 300 Morristown, OH 43759 614-782-1016	Marshall Strip	Muskingum	15,801	Mum-231	C-1525
L & M Minerals, Inc. P.O. Box 54 Millersburg, OH 44654 216-893-2227	Evans Luikert Romig	Tuscarawas Tuscarawas Tuscarawas	18,328 5,838 8,852	Ts-1884 Ts-1914 Ts-1930	IM-6 IM-741 IM-6
LaMay Coal Co., Inc. P.O. Box 663 Cambridge, OH 43725 614-439-4481	LaMay Mine LaMay Mine	Jackson Jackson	10,955 123,276	Jkn-573 Jkn-1054	
Lee & Lawson, Inc. Rte. 1 Box 65 Albany, OH 45710 614-698-6364	Mason Hill Mine	Athens	2,833	As-271	D-0151
Lisbon Coal Crushers, Inc. 37544 Hunters Camp Rd. P.O. Box 492 Lisbon, OH 44432 216-424-9559	Lisbon Coal Crushers, Inc. McLaughlin	Columbiana Columbiana	8,451 6,133	Ca-900 Ca-901	D-0367 D-0138
Lox Construction Co. 4141 Cleveland Rd. Wooster, OH 44691 216-345-6343	Lox Pit Morris Wilson #2	Perry	21,593	Py-315	D-0156
M & M Builder's Supply 5820 Carbon Hill Rd. East Palestine, OH 44413 216-426-9958	Parker-Madden	Columbiana	2,892	Ca-877	
M & S Coal Co., Inc. 45542 Cream Ridge Rd. Lisbon, OH 44432 216-385-0304	M & S Coal Co., Inc. M & S Coal Co., Inc.	Columbiana Columbiana	4,855 37,206	Ca-863 Ca-MS ⁵	C-1289 D-0176
Mac Mining Co. P.O. Box 218 Carrollton, OH 44615 216-627-5154	CAM #2	Carroll	42,903	Cl-207	C-1510, D-0231, D-0441
Mackra Minerals P.O. Box 218 Carrollton, OH 44615 216-739-3341	Mackra Minerals	Jefferson	19,061	Jfn-790	D-0336
Magnum Coal, Inc. P.O. Box 398 Lisbon, OH 44432 216-424-9501	Magnum Coal, Inc.	Columbiana	20,984	Ca-891M ⁶	D-0071
Red Malcuit, Inc. 707 South Wooster Ave. P.O. Box 166 Strasburg, OH 44680-0166 216-878-7114	RMI #1	Tuscarawas	62,223	Ts-1918	C-1238, D-0236
Mansfield Hawk Mining, Inc. 514 Woodside Ave. North Canton, OH 44720 216-497-2706	Mansfield Hawk Mining Mansfield Hawk Mining	Columbiana Stark	7,676 53,599	Ca-896 Sk-201	C-1447, D-0212 D-0020

⁵No mine number has been assigned by the Division of Mines.⁶This mine number has been duplicated for another company.

1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS—Continued

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
Marietta Coal Co. R.D. 1 Friends Church Rd. St. Clairsville, OH 43950 614-695-2197	Negus-Berry	Belmont	29,754	Bt-82	C-1352
	Swingle-Smigle	Belmont	16,335	Bt-112	C-1544
	Borovich-Seaway et al.	Belmont	74,297	Bt-147M ⁷	D-0022
	Hays-Blake	Belmont	52,060	Bt-150	D-0058
	H. Carpenter-Loy	Belmont	28,264	Bt-151	D-0059
	Consol	Belmont	27,894	Bt-154	D-0270
	Snedeker-Consol-Keefer	Belmont	67,218	Bt-865	D-0118
	Ayers	Belmont	19,876	Bt-905	C-1301
	Barack-Henthorne	Belmont	21,828	Bt-1104	D-0088
	Seabright-Bigley	Belmont	13,708	Bt-1105	D-0333
	Evick-Slewinski-Mick	Belmont	137,584	Bt-1107	D-0064, D-0303
	Nicholson-Marcinko	Belmont	29,611	Bt-1108	D-0250
	Consol	Belmont	49,067	Bt-1109	D-0270
	Bedway-Wehr-Adamsky	Jefferson	4,644	Jfn-783	C-1657
McGinness Bros. Coal, Inc. P.O. Box 345 Dover, OH 44622 216-364-6651	McGinness Bros. Strip	Harrison	42,685	Hn-211	
	McGinness Bros. Strip	Harrison	44,640	Hn-742	
Merco Mining, Inc. P.O. Box 409 Moxahala, OH 43761 614-342-1809	Merco Strip #2	Gallia	195,948	Ga-240	C-0616, D-0302
	Merco Strip #4	Perry	23,868	Py-316	D-0310
Ted Mesmer & Sons 10950 Woodworth Ave. North Lima, OH 44452 216-549-2385	Humeniuk-Dungannon V Pts. Mine	Columbiana Mahoning	13,439	Ca-854	
			6,811	Mg-59	
Midway Coal, Inc. 23148 U.S. Rte. 30 Minerva, OH 44657 216-868-6080	Midway Coal, Inc.	Carroll	2,942	Cl-22	D-0358
Miller Mining Co. Rte. 2 Box 254 Sugarcreek, OH 44681 216-852-4012	Miller Mines Miller Mines	Holmes Tuscarawas	41,717	Hs-85	D-0234
			5,942	Ts-1947	
Milton Mining Co. P.O. Box 548 Jackson, OH 45640 614-682-7787	Greasy #1	Jackson	108,022	Jkn-548	D-0368
Mudsock Minerals, Inc. P.O. Box 963 New Philadelphia, OH 44683 216-343-2200	Welling Pit	Tuscarawas	30,288	Ts-1943	
Muskingum Mining, Inc. 6422 East Main St. Reynoldsburg, OH 43068 614-866-6505	Muskingum Mine	Muskingum	730,606	Mum-206	C-0461, C-1047, C-1214, D-0007, D-0154, D-0181, D-0235, D-0342
Nacco Mining Co. Central Division 12800 Shaker Blvd. Cleveland, OH 44120 216-752-1000	Powhatan #6	Belmont	1,246,538	Bt-68	D-0341
Nutter Bros. Coal Co., Inc. P.O. Box 248 New Straitsville, OH 43766 614-394-2678	Nutter Bros. Coal Co., Inc.	Hocking	37,098	Hg-316	D-0120
Ohio Coal & Construction Corp. P.O. Box 2388 Wintersville, OH 43952 614-264-7704	No. 38 Strip-Blaine Area	Belmont	78,482	Bt-99	C-1011
	No. 38 Strip-Banfield Rd.	Belmont	76,255	Bt-142	C-1540, D-0256
	No. 38 Strip-Martins Ferry	Belmont	19,019	Bt-889	C-1554, C-1555
	No. 38 Strip-Yorkville	Belmont	6,903	Bt-918	C-1412, D-0079
	No. 38 Strip-Sunset Heights	Belmont	6,589	Bt-1094	C-1577
	No. 38 Strip	Belmont	126,395	Bt-1100	C-1209
	No. 38 Strip	Belmont	29,997	Bt-1101	D-0166
	No. 36 Strip	Jefferson	232,997	Jfn-711	D-0009, D-0180
	No. 38 Strip Y/O	Jefferson	156,501	Jfn-787	D-0079, D-0345
	No. 30	Jefferson	18,649	Jfn-791	D-0410
Ohio Edison Co. 76 S. Main St. Akron, OH 44308 216-384-5100	Ohio Edison Co. Strip Mine	Jefferson	133,961	Jfn-1267	D-0142
Ohio River Collieries, Inc. P.O. Box 128 Bannock, OH 43972 614-968-3504	Miller	Belmont	43,205	Bt-137	C-1534, D-0338
	2400 Large	Belmont	37,471	Bt-957	C-1313, D-0298
	Negus Strip	Belmont	86,059	Bt-992	C-1023, D-0305
	Lafferty 7400	Belmont	162,011	Bt-1074	C-1451, D-0340
	Fairview	Guernsey	827	Gy-290	C-1254

⁷This mine number has been duplicated for another company.

1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS—Continued

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
Orchard Mining, Inc. P.O. Box 591 Dover, OH 44622 216-343-5459	Orchard Mining, Inc.	Tuscarawas	23,656	Ts-1940	D-0162
P & J Mining Co. 3130 Belmont Ave. P.O. Box 2228 Youngstown, OH 44504 216-759-9317	P & J Mining Co.	Columbiana	15,579	Ca-345	D-0227
Peabody Coal Co. Eastern Division 1951 Barrett Court Henderson, KY 42420 502-827-0800	Sunnyhill #9 South Sunnyhill #9 North	Perry Perry	722,248 703,231	Py-265 Py-271	D-0324 D-0326
Plate Coal Co. 17900 State Rte. 45 Wellsville, OH 43968 216-532-2814	Plate #2	Columbiana	9,200	Ca-714	
Puskarich Limestone Co. 40580 Cadiz-Piedmont Rd. Cadiz, OH 43907 614-942-4656	Limestone Plant	Carroll	16,856	Cl-183	IM-7
Puskarich Mining, Inc. 40580 Cadiz-Piedmont Rd. Cadiz, OH 43907 614-942-4656	Germano Bowerston New Cumberland	Carroll, Harrison Harrison Tuscarawas	12,701 67,155 93,029	Hn-729 Hn-743 Ts-1917	C-1519 C-1561 C-1132
Quality Coal Co. Rte. 1 Cheshire, OH 45620 614-992-5639	Wharton Strip Broken Arrow Jaymar Pit	Hocking Jackson Vinton	118,453 5,985 727,290	Hg-313 Jkn-Q ^s Vn-655	D-0145, D-0278 D-0427 D-0004, D-0219
Quarto Mining Co. 12800 Shaker Blvd. Cleveland, OH 44120 216-752-1000	Powhatan #4 Powhatan #7	Monroe Monroe	3,203,940 270,156	Me-4 Me-8	D-0339 D-0342
R & E Coal Co. 8693 Bender St. Navarre, OH 44864 216-879-5864	R & E Coal Co.	Tuscarawas	3,699	Ts-1925	D-0093
R & F Coal Co. 538 North Main St. P.O. Box 247 Cadiz, OH 43907 614-942-2186	Butcher-Kacere Cain-Gregg Marsh-Jefferis Stenger-DeVault Newlin-Sproul Doleski-Consol Hollingworth Phillips Shipe Loy-McFarland Merritt-Ramsay Collins Black Oak Shepard Smith-Briggs Cleaver-Morrison Wilkinson Roahrig Lauvray Farrell-Moore Hart Watson-Huhn Gilmore Ridge Extension Strauss Croskey Corban County Home-Gilmore Ridge Jewett-Sportsman Mihelios-Pruneski Penova-Meyers Varkony-Kross-Polen Timmons Allgyer-Schupp	Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont Belmont, Jefferson Coshocton Coshocton Coshocton Guernsey Guernsey Guernsey Harrison Harrison Harrison Harrison Harrison Harrison Harrison Harrison Harrison Harrison Noble Tuscarawas	25,235 201,038 32,729 16,564 152,356 3,005 197,543 322,801 46,129 214,787 58,570 149,327 139,247 70,361 3,640 154,471 141,601 105,722 15,412 254,445 163,923 23,087 40,300 67,106 10,920 32,163 203,426 120,591 223,940 116,953 150,164 143,267 61,351	Bt-95 Bt-127 Bt-138 Bt-148 Bt-149 Bt-152 Bt-153 Bt-984 Bt-993 Bt-1095 Bt-1096 Bt-1097 Bt-1098 Bt-1103 Bt-1116 Jfn-750 Cn-802 Cn-803 Cn-806 Gy-279 Gy-300 Gy-RF ^s Hn-204 Hn-207 Hn-216 Hn-704 Hn-731 Hn-735 Hn-739 Hn-746 Jfn-720 Ne-143 Ts-1945	D-0045 D-0047 C-1548 D-0034, D-1025 D-0053 D-0070 D-0081 D-0263 C-1466 D-0096 D-0095 D-0143 C-1111 D-0312 D-0423 D-0131 D-0251 D-0253 D-0198 C-1497 D-0177 D-0262 D-0117 D-0186 D-0194 D-0121 D-0044 D-0122 D-0119 D-0073 C-1546, D-0158 D-0114 D-0300
R V G, Inc. P.O. Box 250 Byesville, OH 43723 614-439-2233	R V G #1 R V G #4	Guernsey Guernsey	22,078 45,954	Gy-296 Gy-301	C-1518, D-0346 D-0346

⁸No mine number has been assigned by the Division of Mines.

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1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS—Continued

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
Regal Mining, Inc. 3335 Steubenville Rd. Carrollton, OH 44615 216-739-3341	Blum-Noble	Carroll	49,379	Cl-216	D-0150
Robinson & Sons Mining 35667 State Rte. 30 Lisbon, OH 44432 216-424-7489	Robinson Mine	Columbiana	2,209	Ca-918	D-0395
Rocon Mining Co. 235 Glenville Rd. Greenwich, CT 06830 203-531-7555	Rogers Mine	Columbiana	10,670	Ca-222	
Rodco, Inc. P.O. Box 295 Berlin, OH 44610 216-893-2721	Rodco #4	Holmes, Wayne	38,571	We-19	C-0583, C-0644, C-0709, D-0352
Royal Oaks Industries, Inc. P.O. Box 626 Jackson, OH 45640 614-682-7787	Liberty Global	Jackson Jackson	120,779 1,081	Jkn-530 Jkn-566	D-0003
S & D Construction Corp. R.D. 1 Toronto, OH 43964 614-544-5616	Rankin Mine #3	Jefferson	53,411	Jfn-1294	C-1526, D-0167
Saginaw Mining Co. P.O. Box 6508 Cleveland, OH 44101 216-861-3300	Saginaw Mine	Belmont	415,518	Bt-643	
Sands Hill Coal Co., Inc. 1203 N. Pennsylvania Ave. Wellston, OH 45692 614-384-5659	Sands Hill Strip #2 Sands Hill Strip	Jackson Vinton	39,752 180,298	Jkn-1055 Vn-641	D-0347 C-1088
Sands Mining Corp. 3445 Adamsville Rd. Zanesville, OH 43701 614-454-1483	Sands Mining Corp.	Muskingum	151,507	Mum-239	D-0089, D-0281
Schiappa Coal Co., Inc. P.O. Box 728 Steubenville, OH 43952 614-282-5301	No. 43 Strip	Jefferson	228,290	Jfn-673	C-0651, C-1029, D-0188
Schlabach Coal Co. P.O. Box 65 Baltic, OH 43804 216-897-5422	Schlabach-Noble	Coshocton	12,930	Cn-776	C-0999
Shawnee Coal Co. P.O. Box 869 Zanesville, OH 43701 614-454-2583	Shawnee Coal Co.	Perry	100,970	Py-314	C-1568, C-1572, D-0275, D-0290, D-0318
Simco-Peabody 1951 Barrett Ct. Henderson, KY 42420 614-623-0660	Simco-Peabody Pit	Coshocton, Muskingum	905,698	Cn-799	D-0023, D-0060
Southern Ohio Coal Co. P.O. Box 490 Athens, OH 45701 614-286-5051	Meigs Mine #1 Meigs Mine #2 Raccoon Mine #3	Meigs Meigs Vinton	1,300,671 2,620,680 1,130,020	Ms-293 Ms-294 Vn-652	D-0354 D-0355 (interim permit)
Star K Mining 266 E. Ohio Ave. Sebring, OH 44672 216-938-2161	Flaming Arrow	Columbiana	272	Ca-342	D-0128
Star Mining Co., Inc. 3549 Marietta Rd. SE Junction City, OH 43748 614-342-1440	Gable Howdyshell	Perry Perry	12,146 17,031	Py-311 Py-321	C-1499 D-0365
Statewide Landfill Co. 1401 Timken Place SW Canton, OH 44706 216-452-4223	Statewide Landfill	Stark	1,220	Sk-219	
Stewart Coal Co. Lake Alma Rd. Wellston, OH 45692	Stewart Mine	Jackson	61,546	Jkn-578	D-0239

1984 OHIO ALPHABETICAL DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS—Continued

Name and address of operator	Name of mine	County	1984 production (tons)	State mine number	Division of Reclamation permit number
Stewart Construction 289 Frank Smith Rd. Wellston, OH 45692 614-384-2646	Field-Bush	Jackson	2,204	Jkn-574	D-0168
T P Mining, Inc. 46938 Almar Circle St. Clairsville, OH 43950 614-269-9219	Monroe Strip	Harrison	50,632	Hn-210	D-0277
Thompson Bros. Mining Co. 3379 E. Garfield Rd. New Springfield, OH 44443 216-549-3979	Peres Mine	Mahoning	55,170	Mg-65	C-0990
Thompson Mining Co. 182 Glass Ave. Byesville, OH 43723 614-685-6726	Costanza Property	Guernsey	8,226	Gy-299	D-0196
Tri-Coal Co. P.O. Box 165 New Philadelphia, OH 44663 216-339-5049	Tri-Coal Co.	Guernsey	43,588	Gy-289	D-0133
Triad Mining, Inc. 204 Second St. NE New Philadelphia, OH 44663 216-364-6062	Clark	Harrison	39,726	Hn-209	D-0225
Valley Coal Co. P.O. Box 148 Union Furnace, OH 43158 614-385-8521	Coonville Darmac	Hocking Hocking	228,559 110,361	Hg-284 Hg-295	
Valley Mining, Inc. Rte. 1 Box 158B Dennison, OH 44621 614-922-3942	Strip #3 Empire-White-Helter	Jefferson Tuscarawas	96,370 15,176	Jfn-785 Ts-1933	D-0090 D-0140
Varkony Mining R.D. 5 Cadiz, OH 43907 614-937-2777	Myers Strip	Harrison	4,931	Hn-701	C-1110
Dallas Vickers R.D. 2 Jewett, OH 43986 614-945-0281	Vickers Mine	Harrison	198	Hn-214	D-0259
W B Coal Co. P.O. Box 516 Steubenville, OH 43952 614-282-6503	Ann Strip	Harrison	82,696	Hn-694	D-0135
Walton Coal Co., Inc. 1500 Mulga Rd. Wellston, OH 45692 614-384-3787	Walton Coal Co., Inc.	Jackson	21,956	Jkn-558	
Waterloo Coal Co. P.O. Box 177 Oak Hill, OH 45656 614-682-7787	Bowman Strip	Jackson	403,383	Jkn-367	IM-774, D-0163, D-0273, D-0286
Weirton Construction Co. 401 Pennsylvania Ave. Weirton, WV 26062 304-748-1400	#19	Jefferson	224,878	Jfn-687	C-1105, D-0404
Wills Creek Energy Co. P.O. Box 663 Cambridge, OH 43725 614-622-6302	Gress Courtright Bartolec Ungurean Frye Miller	Coshocton Coshocton Coshocton Coshocton Coshocton Perry	18,724 132,363 150,693 11,820 17,446 64,480	Cn-741 Cn-768 Cn-779 Cn-800 Cn-WC ^a Py-313	C-1123, C-1170 D-0208 C-1437, D-0320 D-0178 D-0370 D-0019
Wilmot Mining Co. P.O. Box 185 Wilmot, OH 44689 216-359-5411	North	Stark	59,286	Sk-180	D-0134
Y & O Coal Co. P.O. Box 1000 St. Clairsville, OH 43950 614-695-4117	Nelms #2	Harrison	862,470	Hn-169	
Zimnox Coal Co. 1211 Third St. Brilliant, OH 43913 614-598-4111	Zimnox #4	Jefferson	64,342	Jfn-703	D-0112, D-0194

^aNo mine number has been assigned by the Division of Mines.

1984 OHIO DIRECTORY OF REPORTING COAL-WASHING PLANTS AND ASSOCIATED FACILITIES, BY COUNTY

County	Name and address of operator	Name of plant	Township	Type of facility
Belmont	Cravat Coal Co. 40580 Cadiz-Piedmont Rd. Cadiz, OH 43907 614-942-4656	Bellaire River Dock Lynn Tipple #1 Tipple #3 Tipple	Pultney Washington Flushing Flushing	dock prep plant—jig, flotation tipple tipple
	Marietta Coal Co. R.D. 1 Friends Church Rd. St. Clairsville, OH 43950 614-695-2197	Loading Dock	Pultney	loading dock, prep plant—jig, flotation, centrifugal dryer, crushers, screens
	Nacco Mining Co. Central Division 12800 Shaker Blvd. Cleveland, OH 44120 216-752-1000	Powhatan #6	Washington	prep plant—jigs, cyclones, centrifuges, thickeners, filters, screens
	North American Coal Corp. 12800 Shaker Blvd. Cleveland, OH 44120 216-752-1000	Central Shop	York	central shop
	R & F Coal Co. 538 North Main St. Cadiz, OH 43907 614-942-2186	Lamira Preparation Plant	Smith	prep plant—heavy-media washers, cyclone, centrifuges, thickeners, filters, crushers, breakers, screens
		Rebuild Center Seaway River Terminal	City of Bellaire	dock
	Saginaw Mining Co. P.O. Box 6508 Cleveland, OH 44101 216-861-3300	Saginaw Mine	Richland	prep plant—heavy-media washers, crushers, screens, picking tables, magnets
Columbiana	C & E, Inc. R.D. 2 Box 177 Toronto, OH 43964 614-537-1498	C & E, Inc.	Madison	prep plant—crushers, screens
	Industrial Mining Co. P.O. Box 1 Lisbon, OH 44432 215-337-9511	Kensington Prep Plant	West	prep plant—heavy-media washer, cyclone, centrifuges, breaker
Coshocton	Cravat Coal Co. 40580 Cadiz-Piedmont Rd. Cadiz, OH 43907 614-942-4656	Lori Tipple	Franklin	tipple
	R & F Coal Co. 538 North Main St. Cadiz, OH 43907 614-942-2186	Barb Tipple	Franklin	tipple
Gallia	Conrich of Ohio, Inc. P.O. Box 59 Addison, OH 45610 614-446-7040	Conrich of Ohio, Inc.	Addison	loading dock
	Crown City Mining, Inc. 6422 E. Main St. Reynoldsburg, OH 43068 614-866-6505	Crown City Mine	Guyan	prep plant—jig, cyclones, crusher, breaker, screens, dryers
	LaMay Coal Co. P.O. Box 607 Jackson, OH 45640 614-439-4481	LaMay Tipple	Addison	tipple
	Zinn Coal Co., Inc. R.D. 1 Box 176 Kanauga, OH 45631 614-446-1408	Zinn Coal Co., Inc.		tipple
Harrison	Consolidation Coal Co. Midwestern Region 101 Plaza East Blvd. Evansville, IN 47715 614-942-4324	General Services #005 Georgetown Prep Plant #019	Short Creek Cadiz	general services prep plant—jigs, flotation, cyclones, centrifuges, filters, crushers, breaker, screens, dryer, picking tables, magnets
		Shovel Maintenance #004 Central Machine Shop #020	Short Creek Cadiz	maintenance shop

**1984 OHIO DIRECTORY OF REPORTING COAL-WASHING PLANTS AND
ASSOCIATED FACILITIES, BY COUNTY—Continued**

County	Name and address of operator	Name of plant	Township	Type of facility
Harrison (con't)	R & F Coal Co. 538 North Main St. Cadiz, OH 43907 614-942-2186	Nitrate Plant Machine Shop/Warehouse	Short Creek Cadiz	nitrate plant shop
Hocking	Nutter Bros. Coal Co., Inc. P.O. Box 248 New Straitsville, OH 43766 614-394-2681	#1 Tipple	Washington	tipple
Jackson	Waterloo Coal Co. P.O. Box 177 Oak Hill, OH 45656 614-682-7787	Bowman Strip	Bloomfield, Madison	prep plant—jig, crushers, breaker, screens, dryers, wash tables
Jefferson	Ohio Coal & Construction Corp. P.O. Box 2388 Wintersville, OH 43952 614-264-7704	#40 Dock-Shop-Washer	Warren	dock, shop, prep plant—heavy- media washer, cyclones, crushers, breaker, screens, dryers
	Route Forty-Three Washer P.O. Box 407 Richmond, OH 43944 614-282-5301	Route Forty-Three Washer	Springfield	prep plant—heavy-media washer
	W B Coal Co. P.O. Box 516 Steubenville, OH 43952 614-282-6503	Ann Tipple	Wayne	tipple
Lawrence	All American Coal, Inc. P.O. Box 644 Ironton, OH 45638 614-533-3742	All American Dock	City of Ironton	dock
	Hanging Rock Dock Co. P.O. Box 624 Ironton, OH 45638 614-533-2088	Hanging Rock Dock Co.	Hamilton	dock
	Harbour Marine, Inc. P.O. Box 1270 Huntington, WV 25714 614-886-8444	Harbour Marine, Inc.		tipple
	Rail River Terminal Pittston Co. Coal Group P.O. Box 4000 Lebanon, VA 24266 703-889-4000	Rail River Terminal	Perry	dock
Mahoning	East Fairfield Coal Co. 10900 South Ave. P.O. Box 217 North Lima, OH 44452-0217 216-549-2165	Tipple Washing Plant	Beaver Beaver	tipple prep plant—cyclones, centri- fuges, thickener, filter, crushers, screens, magnets
	Thompson Bros. Mining Co. 3379 E. Garfield Rd. New Springfield, OH 44443 216-549-3979	Tipple	Springfield	tipple
Meigs	Raven Hocking Coal Corp. P.O. Box 108 Mason, WV 25260 304-773-5750	Raven Dock	Sutton	dock
	Southern Ohio Coal Co. P.O. Box 490 Athens, OH 45701 614-286-5051	Meigs Mine No. 1	Salem	prep plant—heavy-media washers, flotation, cyclones, centrifuges, thickeners, filters, breaker, screens
Monroe	Quarto Mining Co. 12800 Shaker Blvd. Cleveland, OH 44120 216-752-1000	Powhatan #4	Salem	prep plant—jigs, cyclones, centrifuges, thickeners, filters, crushers
		Powhatan #7	Salem	prep plant—jigs, cyclones, centrifuges, thickeners, filters, crushers
Muskingum	King Quarries, Inc. 2215 Adamsville Rd. Zanesville, OH 43701 614-453-9961	King Strip Tipple	Washington	tipple

**1984 OHIO DIRECTORY OF REPORTING COAL-WASHING PLANTS AND
ASSOCIATED FACILITIES, BY COUNTY—Continued**

County	Name and address of operator	Name of plant	Township	Type of facility
Muskingum (con't)	Wills Creek Energy Co. P.O. Box 663 Cambridge, OH 43725 614-439-4481	Zanesville Tipple	Newton	tipple
Noble	Central Ohio Coal Co. P.O. Box 98 Cumberland, OH 43732 614-962-2013	Muskingum Mine	Brookfield	prep plant—jigs, flotation, cyclones, thickener, filters, crushers, breakers, screens, magnets
Perry	Peabody Coal Co. Eastern Division 1951 Barrett Court Henderson, KY 42420 502-827-0800	Sunnyhill Preparation Plant #0297	Pike	prep plant—jigs, cyclones, crushers, breaker, screens, centrifuges
Scioto	Ky-Oh Transportation Co. P.O. Box 214 Wheelersburg, OH 45694 606-932-3101	Ky-Oh Transportation Co.	Porter	dock
Stark	K & R Enterprises, Inc. P.O. Box 247 Canfield, OH 44406 216-533-9803	Keffler & Rose Preparation	Paris	prep plant—jigs, cyclones, centrifuges, thickeners, filters, crushers, screens, dryers
Tuscarawas	Central Fuel Co. P.O. Box 165 New Philadelphia, OH 44663 216-339-5049	Stonecreek Mine	York	prep plant—jig, screen, dryers
	Empire Coal Co. P.O. Box 750 Gnadenhuttten, OH 44629 614-254-4395	Empire Coal Co.	Clay	prep plant—jig, flotation, cyclones, filters, crushers, screens
	G2X Hardy, Inc. P.O. Box 340 Sugarcreek, OH 44681 216-852-2431	Barrs Mills Tipple	Sugar Creek	tipple
	Horizon Coal Corp. P.O. Box 618 Beach City, OH 44608 216-756-2414	Horizon Coal Wash Plant	Lawrence	prep plant—jigs, cyclones, centrifuges, crushers, screens, picking tables
Vinton	Sands Hill Coal Co. 1203 N. Pennsylvania Ave. Wellston, OH 45692 614-384-5659	Sands Hill Strip	Clinton	prep plant—heavy-media washers, flotation, cyclones, centrifuge, crushers, screens, dryer, picking tables, magnets
	Southern Ohio Coal Co. P.O. Box 490 Athens, OH 45701 614-286-5051	Raccoon Mine No. 3	Wilkesville	prep plant—heavy-media washer, jig, flotation, cyclones, centrifuges, thickeners, filters, crusher, breaker, screens, magnet
Wayne	Holmes Limestone Co. P.O. Box 295 Berlin, OH 44610 216-893-2721	Holmes Wash Plant	Franklin	prep plant—jigs, centrifuges

1984 OHIO DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS, BY COUNTY

NOTE: This directory lists only the coal-producing operations. It does not list tippleries, loading docks, preparation plants, or other active, nonproducing operations that would contribute to employment and wage statistics presented on p. 21-23. Information shown is as reported by the operators.

SEAM IDENTIFICATION

1 Sharon	5	8	12	Washington
3 Lower Mercer	5A	8A	A	Anderson
3A Upper Mercer	6	9	BC	Brush Creek
3B Tionesta	6A	10	H	Harlem
4 Brookville	7	11	W	Winters
4A Clarion				

Name of operator	Name of mine	Township	Seam	Thickness (inches)	Type of mine	Method of production	Tonnage produced in 1984	Days in operation in 1984	Disposition		Employment		State mine number	
									Method	Tonnage	Production			Non-production
											Underground	Surface		
ATHENS COUNTY — Total production = 2,833 tons														
Lee & Lawson, Inc.	Mason Hill Mine	York	6		surface	strip	2,833	30	truck	2,833		1	As-271	
BELMONT COUNTY — Total production = 6,863,941 tons														
Bannock Coal Co. Consolidation Coal Co.	Michelena Mahoning Valley #033	Wheeling	9	42	surface	strip	367,054	161	truck	367,054		67	Bt-133	
		Wheeling	8A	30	surface	strip	774,537	249	truck	602,482		43	Hn-700 ¹	
Cravat Coal Co.	2400 #1	Flushing	8	40	surface	strip	44,575		Total	285,297				
			9	41		Total	819,112		truck	887,779		13	Bt-146	
	Flushing #9	Flushing	8	40	surface	strip	73,870	219	truck	39,535				
			9	42	surface	strip	250,809		truck	26,439				
	Malcuit #2 Hendrysburg	Flushing	9	42	surface	strip	7,227	260	water	31,406		24	Bt-967	
						auger	258,036		truck	107,101				
	Loase-Sawyer Kruclow	Kirkwood	11	22	surface	strip	67,983		Total	101,777				
		Kirkwood	8	36	surface	strip	124,432	208	truck	240,284		16	Bt-143 Bt-147C ²	
	Dover-Kriechbaum Dudek #2	Richland	11	42	surface	strip	3,239		truck	66,683				
			8		surface	strip	12,118		truck	123,612				
	Mei-Worth Flushing	Richland	11	36	surface	strip	136,550	69	Total	132,707		1	Bt-982	
			8		surface	strip	3,239		truck	3,201		2	Bt-988	
		York	8	54	surface	strip	13,373		truck	13,689				
		Wheeling	8	52	surface	strip	19,969	154	truck	19,430		7	Bt-78	
		Richland	9	42	surface	strip	10,331	14	truck	10,331		1	Bt-616	
		Flushing	8	36	surface	strip	32,878		truck	32,878		10	Bt-927	
			9	36	surface	strip	384,467	34	truck	438,604		49	Bt-977	
			9	36	surface	strip	54,137		truck					
		Colerain	8	60	surface	strip	438,604		truck					
		Colerain, Pease	11	31	surface	strip	10,430	26	truck	10,430		2	Bt-980 Bt-82	
			12	27	surface	strip	28,977	48	truck	29,754				
					surface	auger	777		truck					
		Colerain	11	30	surface	strip	29,754		truck					
		Colerain	11	30	surface	strip	16,335	40	truck	16,335			Bt-112	
		Colerain	11	25	surface	strip	13,708	17	truck	13,708			Bt-1105	
		Colerain	12	25	surface	strip	29,174	43	truck	29,611			Bt-1108	
		Colerain	9	37	surface	strip	437		truck					
		Nicholson-Marcunko			surface	auger	29,611		truck					
					Total									

(See also Harrison County mine number has been duplicated for another company.)

1984 OHIO DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS, BY COUNTY—Continued

Name of operator	Name of mine	Township	Seam	Thickness (inches)	Type of mine	Method of production	Tonnage produced In 1984	Days in operation In 1984	Disposition		Employment			State mine number
									Method	Tonnage	Production		Non- production	
											Under- ground	Surface		
BELMONT COUNTY (continued)	Marietta Coal Co. (cont)	Goshen, Union Pease Richland	11 12 11	30 58 40	surface surface surface	strip	52,060	53	truck	52,060	60	23	Bt-150 Bt-905 Bt-147M ³	
						strip	19,876	25	truck	19,876				
						strip auger	61,652 12,645	89	truck	74,297				
	H. Carpenter-Loy Shedeker-Consol Keefer	Richland Richland, Smith	11 10 11 12	37 20 36 30	surface surface	strip	28,264	28	truck	28,264	60	23	Bt-151 Bt-865 ^a	
						strip	61,374	80	truck	67,218				
						auger	5,844							
	Barack Henthorne Evick-Slewinski Mick	Richland Richland	11 11	36 45	surface surface	Total	67,218		truck	21,828	265	109	Bt-1104 Bt-1107	
						strip	21,828	34	truck	21,828				
						strip auger	129,259 8,325	84	truck	137,584				
	Consol Consol	Union Union	8 8	51 51	surface surface	Total	137,584		truck	27,894	265	109	Bt-154 Bt-1109	
strip						27,894	59	truck	49,067					
auger						5,171								
Nacco Mining Co.	Powhatan #6	Washington	8	62	slope	Total	49,067	241	rail truck	1,181,004 30	265	109	Bt-68	
						cont. miner								
							1,246,538			1,181,034				
Ohio Coal & Construction Corp.	No. 38 Strip-Martins Ferry No. 38 Strip-Yorkville No. 38 Strip-Sunset Heights No. 38 Strip No. 38 Strip-Blaine Area	Pease Pease Pease Pease Richland	12 11 12 12 9	60 36 60 60 48	surface surface surface surface surface	strip	19,019	137	truck	19,019	3	3	Bt-889 Bt-918 Bt-1094 Bt-1101 Bt-99	
						strip	6,903	69	truck	6,903				
						strip	6,589	69	truck	6,589				
						strip	29,997	197	truck	29,997				
						strip	78,482	265	truck	78,482				
	No. 38 Strip-Banfield Rd. No. 38 Strip Negus Strip	Richland Richland Colerain	11, 12 12 12	36 60 48	surface surface surface	strip	76,255	266	truck	76,255	7	7	Bt-142 Bt-1100 Bt-992	
						strip	126,395	187	truck	126,395				
						strip	85,159	108	truck	86,059				
						auger	900							
						Total	86,059							
Ohio River Collieries, Inc.	Miller 2400 Large Laferty #400	Union Union Union	9 11 9 11	40 28 42 28	surface surface surface surface	strip	43,205	84	truck	43,205	5	1	Bt-137 Bt-957 Bt-1074	
						strip	37,471	92	truck	37,471				
						strip	160,276	85	truck	162,011				
						auger	1,735							
						Total	162,011							
	Cleaver-Morrison	Colerain	11	30	surface	strip	77,292		water truck	57,693 11,863	8	1	Jfn-750 ^s	
						strip				69,556				
						Total	195,222 5,816	98	water truck	163,530 33,673				
						strip								
						Total	201,038			197,203				
R & F Coal Co.	Cain-Gregg	Goshen	11, 12	35	surface	strip	197,543	124	water truck	163,162 33,478	21	4	Bt-127	
						strip								
						Total	197,543			197,203				
Hollingsworth	Goshen	11	24	surface	strip	197,543	124	water truck	163,162 33,478	25	5	Bt-153		
					strip									
					Total	197,543			197,203					
Collins	Goshen	11	24	surface	strip	109,943	85	water truck	120,794 24,830	15	5	Bt-1097		
					strip auger	39,384			24,830					
					Total	149,327			145,624					

Shepard	Goshen, Smith	11	surface	strip	70,361	46	water truck	58,468 11,972	2	Bt-1103
Phillips	Kirkwood, Warren	8 9, 11	48 20	strip auger Total	312,861 9,940 322,801	157	water truck other Total	270,130 51,494 383 322,007	7	Bt-984
Shipe	Kirkwood	8 9	45 40	strip	46,129	25	water truck Total	38,119 7,897 46,016	1	Bt-993
Butcher-Kacere	Richland	11	41	strip auger Total	22,424 2,811 25,235	5	water truck Total	18,177 3,782 21,959	2	Bt-95
Newlin-Sproul	Richland	11 12	42 40	strip auger Total	133,420 18,936 152,356	44	water truck Total	136,347 27,957 164,304	4	Bt-149
Loy-McFarland	Richland	11	36	strip	214,787	117	water truck Total	174,717 33,140 207,857	5	Bt-1095
Merritt-Ramsay	Richland	11	24	strip	58,570	14	water truck Total	48,202 10,021 58,223	1	Bt-1096
Doleski-Consol Marsh-Jeffers	Smith Somerset	11 11	26 32	strip strip strip	3,005 32,729	22 27	none water truck Total	27,105 5,581 32,686	1	Bt-152 Bt-138
Smith-Briggs	Somerset, Wayne	11		strip	3,640	2	water truck Total	2,971 609 3,580		Bt-1116
Stenger-DeVault	Union	11	20	strip	16,564	44	water truck Total	15,227 3,178 18,405	1	Bt-148
Black Oak	Union, Wheeling	9	48	strip auger Total	95,914 43,333 139,247	87	water truck Total	162,911 33,457 196,368	4	Bt-1098
Saginaw Mine	Richland	8	60	cont. miner	415,518	178	rail truck Total	389,136 205 389,341	54	Bt-643
CARROLL COUNTY — Total production = 364,671 tons										
Industrial Mining Co.	Brown Brown	6 6	26 36	strip strip auger Total	50,997 42,214 3,722 45,936	154 59	truck truck	50,997 45,936	3 4	Ci-219 Ci-223
James Bros. Coal Co.	East Rose Rose	6 6 5	30 42 22	strip strip surface strip	27,046 68,683 53,579	127 242	truck truck	27,046 68,683 53,579	2 22	Ci-220 Ci-17 Ci-162
Mac Mining Co. Midway Coal, Inc. Puskarch Limestone Co.	Lee, Union Brown Lee	H 6 H	18 29	strip surface surface strip strip	42,903 2,942 16,856	249 87 173	truck truck water truck Total	42,903 2,942 4,700 10,756 15,456	6 2 2 1	Ci-207 Ci-22 Ci-183
This mine number has been duplicated for another company. Employment reported for Bt-865 is a summary of employment for all Marietta Coal Co. operations.										

³⁷This mine number has been duplicated for another company.

⁴Employment reported for Bt-865 is a summary of employment for all Marietta Coal Co. operations.

⁵See also Jefferson County.

1984 OHIO DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS, BY COUNTY—Continued

Name of operator	Name of mine	Township	Seam	Thickness (inches)	Type of mine	Method of production	Tonnage produced in 1984	Days in operation in 1984	Disposition		Employment		State mine number
									Method	Tonnage	Production		
											Underground	Surface	
CARROLL COUNTY (continued)													
Puskarch Mining, Inc.	Germano	Loudon	8	37	surface	strip	6,350		rail truck	740	1		Hn-729 ^a
									Total	5,404			
Regal Mining, Inc.	Blum Noble	Lee	H	19	surface	strip	49,379	125	truck	49,379	8	5	Cl-216
Blum Coal Co. Buckeye Coal Mining Co., Inc.	Guilford Lake Job Buzzard Pit	Center Madison	6 6	17 30	surface surface	strip strip auger	46,666 28,675 6,871	298 154	truck truck	46,666 35,546	6 6	5	Ca-B7 Ca-240
						Total	35,546						
C & E, Inc.	Mick Pit Boyd Pit C & E, Inc.	Yellow Creek Yellow Creek Madison	6 7 6	30 20	surface surface surface	strip strip strip auger	34,740 20,084 5,818 1,591	104 59	truck truck	34,740 20,084 7,409	3 2	1	Ca-864 Ca-912 Ca-921
						Total	7,409						
C & W Mining Co. Central Mining Co. Coalbrook Mining Co. Commercial Minerals, Inc.	C & W Strip #2 Ullom Pit Toth Strip "C" Mine	Elkrun Center Franklin Hanover	6 BC 6 6	36 24 21 20	surface surface surface surface	strip strip strip strip	16,169 2,733 24,102 55,103	72 20 297 125	truck truck truck	16,169 2,733 24,102 55,103	9 1 3 6	5 2 1	Ca-875 Ca-904 Ca-765 Ca-829
Crawford Coal Co. D & D Mining Co.	West Point Crawford Coal Co. Lyons Pit Jack Foster Pit Unity	Hanover Elkrun Middleton	6 6 4	40 28 34	surface surface surface	strip strip strip	16,419 23,218 4,336	49	truck	16,419	3		Ca-919
East Fairfield Coal Co.	John Foster Pit John Foster Pit Unity Dickson Pit "W" Mine	Unity Unity Unity Fairfield	4 4 4 7	30 30 30 25	surface surface surface surface	strip strip strip strip auger	29,430 29,430 15,448 90,705 1,977	232 309 171	truck truck truck truck	29,430 29,430 15,448 94,272	6 7 14	1 1	Ca-885 Ca-888 Ca-894
						Total	92,682						
Ferris Coal Co., Inc.	"F" Mine 7400 Mine Guilford Mine	Salem Elkrun Hanover	7 6 6	25 24	surface surface surface	strip strip strip	24,074 75,960 4,213	59 147	truck	24,074	3		Ca-344 Ca-154
Getz Coal Sales, Inc. Hanover Coal Co. Hutsen Road Mining Co.	Getz Coal Sales, Inc. Burchfield Strip #3 Hutsen Road Mining Co.	Center Hanover Middleton	6 7 6	24 12 34	surface surface surface	strip strip strip	4,306 30,493 5,131	166 129 52	truck	4,306 30,493 5,131	3 2 2	1	Ca-784 Ca-G7 Ca-339 Ca-336
Industrial Mining Co.	Hutsen Road Mining Co. Traxes Industrial Mining Co.	Middleton Wayne Wayne	6 6 6	34 30 23	surface surface surface	strip strip strip auger	1,517 50,067 17,381 2,291	13 154 59	truck truck truck	1,517 50,067 19,672	2 4		Ca-917 Ca-907 Ca-909
						Total	19,672						
	Rogers	West	6	20	surface	strip auger	57,651 15,381	177	truck	73,032	8		Ca-850
						Total	73,032						
Jeffco Sales & Mining Co.	McCormicks Run	Madison	6A	36	surface	strip auger	5,583 4,380	28	truck	9,963	4	1	Ca-895
						Total	9,963						
Johnson Mining Co. K & R Enterprises, Inc.	Johnson Mining R-3	Madison Center, Franklin, Wayne	6A, 7 6	36	surface surface	strip strip	26,817 80,797	185 194	truck truck	26,817 80,797	7 11	3	Ca-883 Ca-836
K D Coal Co., Inc. Lisbon Coal Crushers, Inc.	Baker Mine McLaughlin Lisbon Coal Crushers, Inc.	Fairfield Wayne Unity	7 7 7	19 28 26	surface surface surface	strip strip strip	12,263 6,133 8,451	308 131 120	truck truck truck	12,263 6,133 8,451	2 1 2	1	Ca-343 Ca-901 Ca-900 Ca-877
M & M Builder's Supply	Parker-Madden	Unity	7	30	surface	strip	2,892	39	truck	2,892	2		

M & S Coal Co., Inc. Magnum Coal, Inc.	M & S Coal Co., Inc. M & S Coal Co., Inc. Magnum Coal, Inc.	Elkrun Madison Elkrun, Madison	6 6 6	28 28 34	surface surface surface	strip strip strip	37,206 4,855 16,307 4,677	44 169 179	truck truck truck	37,206 4,855 20,984	10 4	1	Ca-MS7 Ca-863 Ca-891M ⁸
Mansfield Hawk Mining, Inc. Ted Mesmer & Sons P & J Mining Co.	Mansfield Hawk Mining Humeniuk-Dungannon P & J Mining Co.	Center Hanover Hanover	6 7 6	16 20	surface surface surface	strip strip strip	7,676 13,439 15,579	77 307 31	truck truck truck	7,676 13,439 15,579	2 2 3	1	Ca-896 Ca-854 Ca-345
Plate #2 Robinson Mine Rogers Mine Flaming Arrow Star K Mining	Plate #2 Robinson Mine Rogers Mine Flaming Arrow Star K Mining	Madison Center Hanover Washington	6 7 6 6	44 24	drift surface surface surface	cont. miner strip auger strip	9,200 2,209 10,670 272	6 18	truck truck truck truck	9,200 2,209 10,670 272	1 3 1		Ca-714 Ca-918 Ca-222 Ca-342
COSHOCTON COUNTY — Total production = 1,573,917 tons													
Cravat Coal Co. G & M Mineral Co. Hutt Coal Co. R & F Coal Co.	Coshocton G & M Mineral Co. Hutt Coal Co. Wilkinson	Franklin, Tuscarawas Bethlehem Tuscarawas Adams, Oxford	6 5 6 6	36 38	surface surface surface surface	strip strip strip strip	40,760 58,115 3,608 141,601	212 216 63 89	truck truck truck water truck	36,370 58,115 3,608 118,260 24,312	4 12 2 12		Cn-766 Cn-757 Cn-804 Cn-802
Lauvray	Lauvray	Keene	5	32	surface	strip	15,412	5	water truck	5,667 8,449		2	Cn-806
Roahrig	Roahrig	Linton	5, 6		surface	strip auger	101,172 4,550	61	water truck	86,115 17,688	10	2	Cn-803
Schlabbach-Noble Simco-Peabody Pit	Schlabbach-Noble Simco-Peabody Pit	Lafayette Franklin, Linton	6 5 6	38 23 38	surface surface surface	strip strip auger	12,930 850,835 13,888	75 227	truck truck conveyor	11,876 13,888 850,835	4 167	4 39	Cn-776 Cn-799 ⁹
Frye Gress	Frye Gress	Lafayette Oxford	5 6 6	30 30 30	surface surface surface	strip strip auger	17,446 15,037 3,687	32 28	truck truck	17,446 18,724	3 1	1 1	Cn-WC7 Cn-741
Courtright	Courtright	Oxford	5 6	30 30	surface	strip auger	126,634 5,729	149	truck	132,363	11	2	Cn-768
Bartolec Ungurean	Bartolec Ungurean	Oxford Tuscarawas	5 6 6	30 30 30	surface surface surface	strip strip	150,693 11,820	166 16	truck truck	150,693 11,820	11 1	3	Cn-779 Cn-800
GALLIA COUNTY — Total production = 444,789 tons													
Crown City Mining, Inc. Green & Burritt Coal Co. Merco Mining, Inc.	Crown City Mine Green Strip Merco Strip #2	Guyan Huntington Huntington	8A 6 6	34 54	surface surface surface	strip strip strip	198,885 49,956 195,948	246 213 132	water truck truck other	207,894 49,956 165,346 30,602	42 4 22	14 2 7	Ca-220 ¹⁰ Ca-242 Ca-240
GUERNSEY COUNTY — Total production = 562,128 tons													
Ohio River Collieries, Inc. R & F Coal Co.	Fairview Farrell-Moore	Oxford Millwood	8 8	42 42	surface surface	strip strip auger	827 138,828 115,617	1 144	truck water truck	827 211,557 43,510	24	5	Gy-290 Gy-279

⁸See also Harrison County.⁹No mine number has been assigned by the Division of Mines.¹⁰This mine number has been duplicated for another company.¹¹See also Muskingum County.¹²See also Lawrence County.

1984 OHIO DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS, BY COUNTY—Continued

Name of operator	Name of mine	Township	Seam	Thickness (inches)	Type of mine	Method of production	Tonnage produced in 1984	Days in operation in 1984	Disposition		Employment			State mine number
									Method	Tonnage	Underground	Surface	Non-production	
GUERNSEY COUNTY (continued) R & F Coal Co. (cont)	Watson-Huhn	Millwood	8		surface	strip auger Total	20,357 2,730 23,087	9	water truck Total	18,756 3,871 22,627		1		Gy-RP ¹¹
	Hart	Wheeling	5 6	29 30	surface	strip auger Total	118,563 45,360 163,923	83	water truck Total	136,973 28,230 165,203		13	3	Gy-300
	R V G, Inc. R V G #4 R V G #1	Jackson Valley	7 7	42 48	surface	strip strip strip	45,954 22,078 8,226	56 68 32	truck truck truck	45,954 22,078 8,226		2 4		Gy-301 Gy-296 Gy-299
	Costanza Property Tri-Coal Co.	Jackson Center	7 7	60 60	surface	strip strip	8,226 43,588	173	truck truck	43,588		7		Gy-289
HARRISON COUNTY — Total production = 3,914,476 tons														
C K & K, Inc.		Monroe	7	38	surface	strip auger Total	61,748 7,399 69,147	64	truck	69,147		9	2	Hn-208
Consolidation Coal Co.	Franklin #125	Athens	8	62	shaft	longwall cont. miner conventional Total	573,128 44,795 5,318 623,241	217	rail truck Total	251,808 288,789 540,597	48		26	Hn-203
	Mahoning Valley #083	Athens, Short Creek	8 8A 9	58 30 41	surface	strip auger Total	214,956 20,100 235,056		truck	235,056		14	5	Hn-700 ¹²
Franklin Coal Co. McGinness Bros. Coal, Inc. Puskarich Mining, Inc.	Oak Park #007	Cadiz	6A	60	shaft	longwall cont. miner conventional Total	659,998 207,381 88,265 955,644	251	rail conveyor Total	568,212 385,613 953,825	163		44	Hn-658
	Brown McGinness Bros. Strip McGinness Bros. Strip Germano	Monroe German German German	7 H H 8		surface surface surface surface	strip strip strip strip	14,505 42,685 44,640 6,351	105 112 145 149	truck truck rail truck Total	14,505 42,685 44,640 5,404 6,144		1 1 2 1		Hn-215 Hn-211 Hn-742 Hn-729 ¹³
	Bowerston	Monroe	7	38	surface	strip auger Total	49,318 17,837 67,155	186	rail truck Total	38,604 25,169 63,773		7		Hn-743
	Gilmore Ridge Extension	Archer	8 8A	53 14	surface	strip auger Total	32,110 8,190 40,300	27	water truck Total	34,392 7,074 41,466		3	1	Hn-204
R & F Coal Co.	Strauss	Archer	8 8A	55 12	surface	strip strip	67,106 10,592	39	water truck Total	51,567 10,592 62,159		6	1	Hn-207
	Corban	Archer	8 8A	50 15	surface	strip strip	32,163	25	water truck Total	28,109 5,788 33,897		3	1	Hn-704
	County Home-Gilmore Ridge	Archer, Cadiz	8 9	42 40	surface	strip auger Total	191,825 11,601 203,426	92	water truck Total	171,917 35,422 207,339		16	4	Hn-731

Jewett-Sportsman	Archer	8 8A	45 12	surface	strip	120,591	71	water truck	103,233 21,235	13	3	Hn-735
Croskey	Green	8, 8A, 9		surface	strip	10,920	7	water truck	8,914 1,826	1		Hn-216
Mihelios Pruneski	Short Creek	8 9	60 34	surface	strip auger	213,344 10,596	125	water truck	183,638 37,761	22	5	Hn-739
Penova-Meyers	Short Creek	8 8A 9	52 20 29	surface	strip auger	114,999 1,954	66	water truck	96,851 19,927	11	3	Hn-746
Monroe Strip Clark	Monroe Franklin	7 7	42 48	surface	strip auger	50,632 33,049	94	truck	50,632 39,726	9	3	Hn-210 Hn-209
Myers Strip Vickers Mine Ann Strip Nellis #2	Short Creek Green German Green	8A 8 H 6A	48 22 56	surface surface shaft	strip strip cont. miner	4,931 198 82,696 862,470	4	truck truck rail truck	4,931 198 82,696 548,055 311,121	9	4 57	Hn-701 Hn-214 Hn-694 Hn-169
Darnac	Starr	6A		surface	strip	110,361		water truck	79,989 30,372			Hg-295
Holmes Limestone Co.	Berlin Clark Clark, Walnut Creek	5 6 5 6	36 30 30 30	surface	strip strip strip	9,540 147,025 5,366	77	truck truck truck	9,540 148,845 5,366	1	1	Hs-64 Hs-86 Hs-H ¹¹
Miller Mining Co. Rodco, Inc.	Walnut Creek Richland	5 3 4	30 28	surface	strip strip	41,717 9,948	129	truck truck	41,717 9,948	2	1	Hs-85 We-19 ¹⁴
Adams Coal Co. B & D Coal, Inc.	Madison Milton	5 3 4	30 24 30	surface	strip strip	3,968 36,288	53	truck truck	3,968 36,288	1	2	Jkn-556 Jkn-570
D & J Energy, Inc. Elk Coal Co., Inc. Gofer Mining Co.	Bloomfield Milton Bloomfield	4A 4 4.5 5	42	surface surface drift	strip strip hand cont. miner	22,912 74,585 5	72	truck truck truck	22,912 74,585 38	7	11	Jkn-583 Jkn-576 Jkn-586

HOCKING COUNTY — Total production = 544,904 tons

HOLMES COUNTY — Total production = 355,228 tons

JACKSON COUNTY — Total production = 1,036,750 tons

¹¹No mine number has been assigned by the Division of Mines.¹²See also Belmont County.¹³See also Carroll County.¹⁴See also Wayne County.

1984 OHIO DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS, BY COUNTY—Continued

Name of operator	Name of mine	Township	Seam	Thickness (inches)	Type of mine	Method of production	Tonnage produced in 1984	Days in operation in 1984	Disposition		Employment			State mine number
									Method	Tonnage	Production			
											Underground	Surface		
JACKSON COUNTY (continued)														
LaMay Coal Co., Inc. Milton Mining Co. Quality Coal Co. Royal Oaks Industries, Inc. Sands Hill Coal Co., Inc.	LaMay Mine	Bloomfield	6	30	surface	strip	10,955	18	truck	8,496		1	Jkn-573	
	LaMay Mine	Bloomfield	5	25	surface	strip	123,276	225	truck	67,785		11	Jkn-1054	
	Greasy #1	Milton	4A	54	drift	cont. miner								
	Broken Arrow	Milton	4	28	surface	strip	108,022	113	truck	108,022	9	2	Jkn-548	
	Liberty	Liberty	1	28	surface	strip	5,985	8	truck	5,985		3	Jkn-Q15	
	Global	Liberty	1	40	surface	strip	120,779	43	truck	120,779		9	Jkn-530	
	Sands Hill Strip #2	Milton	4A	30	surface	strip	1,081	90	truck	1,081	1	Jkn-566		
			5	15			39,752		truck	39,752			Jkn-1055	
Stewart Coal Co. Walton Coal Co., Inc. Waterloo Coal Co.	Stewart Mine	Jackson	6	15	surface	strip	61,546	193	truck	61,546	6		Jkn-578	
	Field Bush	Milton	1	24	surface	strip	2,204	20	truck	2,204			Jkn-574	
	Walton Coal Co., Inc.	Milton	5	36	surface	strip	21,956	142	truck	21,956	3	3	Jkn-558	
	Bowman Strip	Bloomfield, Madison	4A	48	surface	strip	403,383	260	truck	403,383	20	14	Jkn-367	
JEFFERSON COUNTY — Total production = 2,077,305 tons														
Anthony Mining Co., Inc. Boich Mining Co. D & L Contractors, Inc. F & M Coal Co.	Island Creek #43	Island Creek	8	48	surface	strip	56,390	187	other	56,390		27	Jfn-693	
	Pipo #51	Knox, Saline	8	42	surface	strip	52,601	69	truck	52,601		1	Jfn-788	
	Maize 307	Wayne	8	48	surface	strip	63,498	172	truck	63,499	43	15	Jfn-789	
	Betsey Mine	Cross Creek	8	56	surface	strip	346,156	246	truck	346,156	9	2	Jfn-528	
	D & L Strip	Smithfield	8	56	surface	strip	65,514		truck	65,514			Jfn-780	
	E & E Strip	Wayne	8A	20	surface	strip	26,622	195	truck	26,622	2		Jfn-784	
			8	16										
			46											
Industrial Mining Co. Jefferson Holding, Inc.	Industrial Mining Co.	Ross	8A	48	surface	auger	1,639	66	truck	1,639		2	Jfn-1286	
	Elkhorn Strip	Springfield	5	34	surface	auger	3,287		truck	4,378		1	Jfn-1277	
					Total		4,378							
Mackra Minerals Marietta Coal Co. Ohio Coal & Construction Corp.	Mackra Minerals	Knox	8	52	surface	strip	19,061	45	truck	19,061	2		Jfn-790	
			8A	10										
	Bedway-Wehr-Adamsky	Mount Pleasant	11	30	surface	strip	4,644	11	truck	4,644	8	4	Jfn-783	
	No. 38 Strip-Y/O	Warren	11	36	surface	strip	156,501	222	truck	156,501	1		Jfn-787	
	No. 30	Warren	11	36	surface	strip	18,649	64	truck	18,649	29	6	Jfn-791	
	No. 36 Strip	Wells	8	60	surface	strip	222,696	268	truck	232,997			Jfn-711	
			8A	24		auger	10,301							
					Total		232,997							
Ohio Edison Co. R & F Coal Co.	Ohio Edison Co. Strip Mine	Knox	8	48	surface	strip	133,961	341	truck	133,961	18	6	Jfn-1267	
	Cleaver-Morrison	Mount Pleasant	11	30	surface	strip	77,239	96	water truck	66,514	8	3	Jfn-75016	
									Total	80,181				
Varkony-Kross-Polen	Varkony-Kross-Polen	Wayne	8	50	surface	strip	150,164	97	water truck	122,888	16	4	Jfn-720	
			8A	22					truck	25,260				
									Total	148,148				
S & D Construction Corp.	Rankin Mine #3	Knox	8	48	surface	strip	46,593	145	truck	53,411	7	2	Jfn-1294	
					auger	auger	6,818							
					Total		53,411							
Schiappa Coal Co., Inc. Valley Mining, Inc.	No. 43 Strip	Island Creek	8	48	surface	strip	228,290	270	truck	228,290	30	10	Jfn-673	
	Strip #3	Smithfield	8A	24	surface	strip	87,795	212	truck	96,370	10	2	Jfn-785	
					auger	8,575								
					Total		96,370							
Weirton Construction Co. Zimnox Coal Co.	#19	Wells	8	54	surface	strip	224,878	190	truck	156,501	22	11	Jfn-687	
	Zimnox #4	Wells	8	50	surface	strip	64,342	106	truck	64,441	8	9	Jfn-703	

LAWRENCE COUNTY — Total production = 392,587 tons									
Belville Mining Co., Inc.	Washington	4A	36	surface	strip	118,828	221	truck	117,330
Crown City Mining, Inc.	Mason	5 8A	24 34	surface	strip	273,759		water	242,909
MAHONING COUNTY — Total production = 183,582 tons									
Cardinal Strip "K" Mine	Green Springfield	3 4 5 6	28 32 32 16	surface surface	strip strip auger Total	27,067 88,077 6,457 94,534	238 194	truck truck	27,067 93,205
V Pts. Mine Peres Mine	Beaver Beaver	5 4	48 30	surface surface	strip strip	6811 55,170	154 306	truck truck	6811 55,170
MEIGS COUNTY — Total production = 3,921,351 tons									
Southern Ohio Coal Co.	Columbia	4A	57	shaft	longwall cont. miner Total	1,477,468 1,143,212 2,620,680	240	conveyor	2,529,023
Meigs Mine #2									486
Meigs Mine #1	Salem	4A	57	shaft	longwall cont. miner Total	171,088 1,129,583 1,300,671	239	conveyor	1,252,880
MONROE COUNTY — Total production = 3,474,096 tons									
Powhatan #4	Salem	8	59	shaft	longwall cont. miner Total	1,964,748 1,239,192 3,203,940	244	water	3,210,530
Powhatan #7	Salem	8	48	slope	longwall cont. miner Total	241,165 28,991 270,156	122	water	268,668
MUSKINGUM COUNTY — Total production = 2,213,173 tons									
Central Ohio Coal Co.	Meigs	9	41	surface	strip	1,049,204		conveyor other	1,049,191 13
Muskingum Mine								Total	1,049,204
Bloomfield	Highland	A	36	surface	strip	42,719	169	rail truck	14,473 22,572
Loase-Patton	Rich Hill, Union	8	38	surface	strip auger Total	37,784 8,435 46,219	77	truck	37,045
Rix Mills	Rich Hill, Union	8	38	surface	strip auger Total	9,992 3,675 13,667	8	rail truck	5,904 9,053
Dolen Excavating	Washington	7		surface	strip auger Total	3,762 958 4,720	224	truck other	3,355 1,365
King Quarries, Inc.	Washington	6	42	surface	strip	6,896	15	truck	6,896
King Strip	Washington	6	42	surface	strip	14,657	48	truck	14,657
King Strip	Wayne	6	42	surface	strip	4,706	1	truck	4,706
King Strip	Wayne	6	42	surface	strip	41,738	117	truck	41,738
King Strip	Wayne	6	42	surface	strip	49,758	109	truck	49,758
Marshall Strip	Union	7	33	surface	strip	6,801	21	truck	15,801
Muskingum Mine	Madison	6		surface	strip	730,606	251	truck	357,858
								conveyor	372,748
								Total	730,606
Sands Mining Corp. Simco Peabody	Washington Monroe	6 6	35 39	surface surface	strip auger	151,507 40,975		truck truck	151,507 40,975
							39		Mum-239 Cm-7981 ¹⁹

¹⁹No mine number has been assigned by the Division of Mines.

¹⁸See also Belmont County.

¹⁷See also Gallia County.

¹⁶See also Noble County.

¹⁵See also Coshocton County.

1984 OHIO DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS, BY COUNTY—Continued

Name of operator	Name of mine	Township	Seam	Thickness (inches)	Type of mine	Method of production	Tonnage produced in 1984	Days in operation in 1984	Disposition		Employment			State mine number
									Method	Tonnage	Production		Non-Production	
											Underground	Surface		
NOBLE COUNTY — Total production = 2,794,430 tons														
B & N Coal Co. Bennoc, Inc. Central Ohio Coal Co.	Orange Strip B & N Coal Quaker City Muskingum Mine	Marion Stock Wayne Brookfield, Sharon	9 9 9 9	30 30 42	surface surface surface surface	strip	161,262	71	truck	161,262	9	17	Ne-137	
						strip	170,637	64	truck	7	12	Ne-138		
						strip	39,881	63	truck	6		Ne-136		
						strip	2,279,383	242	conveyor other	137 30	405	Ne-41 ^a		
						Total	2,279,383		Total	2,279,383				
R & F Coal Co.	Timmons	Beaver	8 9	45 40	surface	strip	120,039	81	water	121,221	13	3	Ne-143	
						auger	23,228		truck	26,363				
						Total	143,267		Total	147,584				
PERRY COUNTY — Total production = 2,090,261 tons														
Crooksville Coal Co.	Crooksville Strip	Bearfield	5 6 7	36 42 14	surface	strip	424,694	240	rail	53,848	52	9	Py-317	
						Total			Total	472,281				
Lox Construction Co. Merco Mining, Inc.	Lox Pit Morris Wilson #2 Merco Strip #4	Clayton, Madison Pleasant	5 6	42	surface	strip	21,593	107	truck	21,593	6	4	Py-315	
						strip	20,146	55	truck	3	3	Py-316		
						auger	3,722		other	3,188				
						Total	23,868		Total	23,868				
Peabody Coal Co.	Sunnyhill #9 North	Bearfield	6	53	drift	cont. miner	702,971	240	rail	559,825	152	26	Py-271	
						conventional	260		truck	145,681				
						Total	703,231		Total	705,506				
	Sunnyhill #9 South	Pleasant	6	53	drift	cont. miner	721,130	240	rail	574,964	135	26	Py-265	
						conventional	1,118		truck	149,621				
						Total	722,248		Total	724,585				
Shawnee Coal Co. Star Mining Co., Inc.	Shawnee Coal Co. Howdyshell Gable	Salt Lick Jackson Pike	6 6 6	96 36 36	surface surface surface	strip	100,970	298	truck	100,970	14	2	Py-314	
						strip	17,031	199	truck	7		Py-321		
						strip	5,637	76	truck	2		Py-311		
						auger	6,509							
					Total	12,146								
Wills Creek Energy Co.	Miller	Harrison	6	30	surface	strip	64,480	48	truck	64,480	4	2	Py-313	
STARK COUNTY — Total production = 917,880 tons														
Bask Coal Co. Burning Hollow Coal Co. East Ohio Limestone Co. ENZ, Inc. Hillcrest Coal, Ltd.	Brad Garaux East Ohio Limestone Ervin Strip & Sickafosse Pit Hillcrest Coal	Paris Paris Lake Sandy Osnaburg	7 6 4 4 6	24 35 40 42 34	surface surface surface surface surface	strip	2,069	65	truck	2,069	12	3	Sk-224	
						strip	79,592	366	truck	3	1	Sk-215		
						strip	6,863	50	truck	11	3	Sk-663		
						strip	116,606	265	truck			Sk-208		
						strip	14,549	50	truck			Sk-196		
						auger	940							
					Total	15,489								
Holmes Limestone Co.	Hillcrest Coal	Osnaburg	5 6 5 3A 4A 4	20 34 33 30 30 24	surface surface surface surface surface	strip	10,813	201	truck	10,813	6		Sk-221	
						strip								
						strip	20,200	155	truck	1	1	Sk-216		
						strip	38,515	154	truck	2		Sk-227		
						strip	163,982	249	truck	17	3	Sk-223		
						strip								
Horizon Coal Corp.	Horizon Strip-Canton	Pike	6 5 6 6	28 38 34 18	surface	strip	191,358	197	truck	199,099	41	2	Sk-225	
						auger	7,741							
						Total	199,099							

Kohl Industries	Black Hawk Mine	Bethlehem, Pike	4 5 22	22	surface	strip	149,547	307	truck	149,547	10	3	Sk-217
Mansfield Hawk Mining, Inc.	Mansfield Hawk Mining	Paris	5A 5 20	18	surface	strip	53,599	255	truck	53,598	9	2	Sk-201
Statewide Landfill Co.	Statewide Landfill	Canton	6 5 22 5A	30 22 18	surface	strip	1,220		truck other Total	630 590 1,220			Sk-219
Wilnot Mining Co.	North	Sugar Creek	6		surface	strip	59,286	207	truck	62,050	15		Sk-180
TUSCARAWAS COUNTY — Total production = 1,594,545 tons													
Arapaho Mining, Inc.	Arapaho Mining, Inc.	Fairfield, Mill, Union	6 7 38	45	surface	strip	58,335	151	truck	58,335	10	3	Ts-1921
Arrow Head Energy, Inc.	Post Boy 101 Arrow Head Strip	Goshen Warwick	6 6 23 6	48 23 42	surface	strip strip auger Total	2,725 95,194 10,945 106,139	72 144	truck truck truck	2,725 106,139	14	4	Ts-1912 Ts-1890
Belden Brick Co. Bluff Hill Coal Co.	Finner-Belden Bluff Hill Coal Co.	Sugar Creek Clay	4 5 6	12 30 36	surface	strip strip auger Total	2,243 4,468 3,017 7,485	30	truck truck	2,243 7,485	1		Ts-1646 Ts-1949
	Bluff Hill Coal Co.	Warwick	6	42	surface	strip auger Total	1,406 2,770 4,176	15	truck	4,176	2		Ts-1893
Burning Hollow Coal Co. Daron Coal Co. Eberhart Coal, Inc.	Strip #2 Bastine Eberhart #2 Hott Strip	Union Sugar Creek Dover	6 3B 5 5A 6	37 26 36 36 36	surface	strip strip strip strip strip Total	39,523 134,842 41,568	92 288 173	truck truck truck	39,523 134,842 48,070	6 9 8	2 1 12	Ts-1932 Ts-1924 Ts-1526
	Eberhart #2 Hott Strip	Dover	5 5 5A 6	36 36 36 36	surface	strip	17,925	148	truck	20,461	8	5	Ts-1882
	Eberhart #2 Hott Strip	Fairfield			surface	strip auger Total	49,024 8,757 57,781	193	truck	66,102	3	3	Ts-1919
	Eberhart #2 Hott Strip	Lawrence	5 5A 6 5, 6	36 36 60	surface	strip	32,485	170	truck	37,282	2	4	Ts-1620
Empire Coal Co.	Empire Pit	Clay			surface	strip auger Total	311,792 8,965 320,757	267	truck	561,466	62	11	Ts-1115
GEX Hardy, Inc.	Bagersville Bluff Valley Spartan Creek Wardell	Auburn Franklin, Wayne Jefferson Goshen	5, 6 5 5, 6 5, 6	24 24 24	surface	strip strip strip strip auger Total	99,960 54,675 25,845 51,169 1,161 52,330	185 226 99 225	truck truck truck truck	99,960 54,675 25,845 52,330	12 5 3 9	4 6 4 1	Ts-1946 Ts-1880 Ts-1929 Ts-1922
Horizon Coal Corp.	Horizon Strip-Belden	Sandy	4	24	surface	strip	167,212	234	truck	146,342	12	2	Ts-1941
J & D Mining Co.	Demuth Pit	Goshen	5 6 6	30 28 40	surface	strip auger Total	33,057 7,100 40,157		truck	40,157	5		Ts-1915
L & M Minerals, Inc.	Lukert Evans Loring RMI #1	Mill Rush, Warwick Warwick York	5 7 6 6	28 40 40 30	surface	strip strip strip strip Total	5,838 18,328 8,852 62,223		truck truck truck truck	5,838 18,328 8,852 62,223	9 9 13 8		Ts-1914 Ts-1884 Ts-1930 Ts-1918
Red Malcuit, Inc.	Miller Mines Welling Pit	Wayne Goshen	5 5 5	36 48 40	surface	strip strip	5,942 30,288	107 85	truck truck	5,942 30,288	1 2	2	Ts-1947 Ts-1943
Miller Mining Co. Mudstock Minerals, Inc.		Dover Warren	5 6 6	40 40	surface	strip strip auger Total	23,656 75,318 17,711 93,029	11 240	truck rail truck	23,656 33,993 56,751	5 11	2	Ts-1940 Ts-1917
Orchard Mining, Inc. Puskarch Mining, Inc.	Orchard Mining, Inc. New Cumberland				surface				Total	90,744			

1984 OHIO DIRECTORY OF REPORTING PRODUCING COAL-MINE OPERATORS, BY COUNTY—Continued

Name of operator	Name of mine	Township	Seam	Thickness (inches)	Type of mine	Method of production	Tonnage produced in 1984	Days in operation in 1984	Disposition		Employment			State mine number
									Method	Tonnage	Production		Non-production	
											Underground	Surface		
TUSCARAWAS COUNTY (continued)														
R & E Coal Co.	R & E Coal Co.	Jefferson	5	26	surface	strip	3,699	54	truck	3,699		1	1	Ts-1925
R & F Coal Co.	Aligyer-Schupp	Clay	6 7	28	surface	strip auger	33,140 28,211	50	water truck	49,738 11,253		7	2	Ts-1945
						Total	61,351		Total	60,991				
Valley Mining, Inc.	Empire-White-Helter	Clay	5 6	28 30	surface	strip auger	10,109 5,067	123	water truck	8,325 6,851		5	1	Ts-1933
						Total	15,176		Total	15,176				
VINTON COUNTY — Total production = 2,235,081 tons														
B & D Coal, Inc.	B & D Coal #1	Clinton	3	24	surface	strip	64,168	173	truck	64,168		5	12	Vn-623
Benedict, Inc.	Benedict, Inc.	Elk	4	30	surface	strip	21,540	71	truck	21,540		1		Vn-654
Eberts Coal Co., Inc.	Quarry Mine	Elk	4A, 5 4A, 5 5	52 22	surface	strip	47,076 56,362	70	truck	47,076		3	1	Vn-13 Vn-163
									conveyor	52,227 4,135		9		
									Total	56,362				
Elk Coal Co., Inc. Quality Coal Co.	Elk Strip Jaymar Pit	Elk Richland Clinton	3 3 4	28 28 28	surface surface	strip strip	8,327 727,290	58 252	truck truck	8,327 727,290		1 38	5	Vn-164 Vn-655
Sands Hill Coal Co., Inc.	Sands Hill Strip	Clinton	W 4A 5 6	28 36 28 20	surface	strip	180,298	208	truck	180,298		34	14	Vn-641
Southern Ohio Coal Co.	Raccoon Mine #3	Wilkesville	6 4A	57	drift	cont. miner	1,130,020	242	rail	1,120,788	332		177	Vn-652
WASHINGTON COUNTY — Total production = 251,520 tons														
B & N Coal Co.	Broom's Run	Aurelius	9	30	surface	strip	251,520	72	truck	251,520		10	17	Wn-51
WAYNE COUNTY — Total production = 28,623 tons														
Rodco, Inc.	Rodco #4	Salt Creek	3 4	30 28	surface	strip	28,623	254	truck	28,623		4		We-1941

²¹See also Holmes County.

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Adams Excavating Co. 40814 State Rte. 517 Lisbon, OH 44432 216-424-5434	Don Adams	Columbiana	sandstone	571	Ca-845	IM-106
Aggregate Services, Inc. 2145 Sipps Lane Hamilton, OH 45013 513-867-1454	Aggregate Services, Inc.	Butler	sand & gravel	66,064	Br-36	IM-649
Alexandria Materials Co. P.O. Box 7 Alexandria, OH 43001 614-924-6611	Alexandria Pit	Licking	sand & gravel	23,756	Lg-8	IM-271
American Aggregates Corp. P.O. Drawer 160 Greenville, OH 45331 513-548-2111	Urbana #215 Springfield #223 Fairborn #413 Fort Jefferson #424 Shawnee #225 Blue Rock Limestone #222 Marble Cliff #224 Columbus #210 Lockbourne #213 Columbus Limestone #221 Cedarville Limestone #423 Xenia #414 Newark #214 Phillipsburg Limestone #421 Dayton Limestone #420 Dayton South #412 Rip Rap Road #416 Lytle Limestone #422 Franklin #417	Champaign Clark Clark Darke Delaware Fayette Franklin Franklin Franklin Franklin Greene Greene Licking Montgomery Montgomery Montgomery Warren Warren	sand & gravel limestone sand & gravel limestone limestone limestone sand & gravel sand & gravel limestone limestone sand & gravel sand & gravel sand & gravel limestone sand & gravel sand & gravel limestone sand & gravel sand & gravel sand & gravel	203,222 90,259 311,072 264,890 312,487 302,267 1,350,514 1,189,463 317,090 1,254,366 177,297 358,530 324,470 263,319 211,707 6,983 312,857 440 167,737	Cpn-1 Ck-1 Ck-13 Dke-1 Del-4 Fe-2 Fn-2 Fn-6 Fn-23 Fn-53 Ge-17 Ge-33 Lg-2 My-1 My-23 My-33 My-66 Wan-35 Wan-38	IM-371 IM-373 IM-366 IM-362 IM-262 IM-169 IM-261 IM-185 IM-183 IM-185 IM-435 IM-379 IM-184 IM-374 IM-368 IM-361 IM-677 IM-112 IM-615
American Materials Corp. P.O. Drawer 160 Greenville, OH 45331 513-548-2111	Hamilton #710 Fairfield #711 Harrison #712 Kilby Rd. #713	Butler Butler Hamilton Hamilton	sand & gravel sand & gravel sand & gravel sand & gravel	263,552 741,150 383,588 328,904	Br-5 Br-35 Hmn-37 Hmn-AMC'	IM-153 IM-200 IM-170 IM-716
Amert Gravel Co. 4843 County Hwy. 43 Rte. 4 Upper Sandusky, OH 43351 419-927-2366	Amert Gravel Co.	Wyandot	sand & gravel	44,950	Wt-4	IM-520
Apache Aggregate & Paving Co. 46626 County Rte. 495 Coshocton, OH 43812 614-622-5904	Apache Aggregate & Paving Co.	Coshocton	sand & gravel	86,021	Cn-783	IM-717
Armco, Inc. 1750 W. Statler Rd. Piqua, OH 45356 513-773-4824	Piqua Minerals	Miami	limestone	462,451	Mi-1	IM-382
Ashcraft Sand & Gravel 5840 Dryfork Rd. Cleves, OH 45002 513-367-2177	Ashcraft Sand & Gravel	Hamilton	sand & gravel	73,800	Hmn-54	IM-710
Athens Building Materials Co., Inc. 250 N. Columbus Rd. P.O. Box N Athens, OH 45701 614-592-2088	Kimberly Pit	Athens	sand & gravel	8,426	As-1117	IM-369
Ayers Limestone Quarry, Inc. 2000 Colerain Pike P.O. Box 67 Martins Ferry, OH 43955 614-633-2958	Ayers Limestone Quarry	Belmont	limestone	124,904	Bt-716	IM-1
Baker Sand, Inc. 9857 Friendsville Rd. Burbank, OH 44214 216-948-1448	Baker Sand, Inc. Baker Sand, Inc.	Medina Medina	sand & gravel sand & gravel	86,918 470,873	Ma-4 Ma-20	IM-426, IM-442 IM-448
Barrett Paving Materials, Inc. 9570 State Rte. 128 Harrison, OH 45030 513-738-1201	Barrett Paving Materials, Inc.	Hamilton	sand & gravel	320,130	Hmn-44	IM-120
Beaver Creek Sand & Gravel, Inc. 7219 Salem Unity Rd. Salem, OH 44460 216-337-3534	Beaver Creek Sand & Gravel, Inc.	Columbiana	sand & gravel sandstone	40,566 34,968	Ca-855	IM-109, IM-891

¹No mine number assigned by the Division of Mines.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Beaver Excavating, Inc. 4650 Southway SW P.O. Box 6412 Canton, OH 44706 216-478-2151	Stone Products, Inc.-Varley Stone Products, Inc.-Fulton	Stark Stark	sand & gravel sand & gravel	168,733 19,328	Sk-190 Sk-207	IM-839 IM-796
Beaver Peat Products Co. P.O. Box 136 Damascus, OH 44619 614-537-2207	Beaver Peat Products Co.	Mahoning	peat	143	Mg-609	
Beck Sand & Gravel, Inc. 2820 Webb Rd. Ravenna, OH 44266 216-626-3863	Beck Sand & Gravel, Inc.	Portage	sand & gravel	176,772	Pe-50	IM-96
Becky Lane Sand 441 Iowa St. Ashland, KY 41101 606-325-8301	Becky Lane Sand	Lawrence	sand & gravel	21,349	Le-430	IM-844
Belden Brick Co. P.O. Box 910 Canton, OH 44701 216-852-2424	Moomaw Pit	Tuscarawas	sandstone clay	180 23,249	Ts-1517	IM-46
	Finzer-Belden Pit	Tuscarawas	shale limestone clay	33,900 6,500 79,241	Ts-1646	IM-44
	Wallick Pit	Tuscarawas	shale clay	123,054 85,156	Ts-1841	IM-45
	Shanesville	Tuscarawas	shale clay shale	23,083 29,151 44,091	Ts-1939	IM-47
Bellbrook Gravel Co. P.O. Box 440 Tipp City, OH 45371 513-667-4431	Bellbrook Gravel Co.	Warren	sand & gravel	153,480	Wan-24	IM-437
Belu & Son Paving, Inc. 4900 French Creek Rd. Lorain, OH 44054 216-277-7087	Belu Sand Pit	Lorain	sand & gravel	960	Ln-12	IM-731
Walter C. Best, Inc. 11830 Ravenna Rd. P.O. Box 87 Chardon, OH 44024 216-946-3441	Best Sand Corp. Best Silica	Geauga Geauga	sandstone sandstone	486,817 63,221	Gea-3 Gea-36 ²	IM-98
Beverly Slag Co. P.O. Box 599 McConnellsville, OH 43756 614-962-5621	Devola Pit	Washington	sand & gravel	525	Wn-55	IM-669
Big Walnut Sand & Gravel Co. 45 N. Wilson Rd. Columbus, OH 43204 614-276-2678	Big Walnut Sand & Gravel Co.	Franklin	sand & gravel	4,100	Fn-14	IM-832
Bluffton Stone Co. P.O. Box 26 Bluffton, OH 45817-0026 419-358-6941	Bluffton Stone Co.	Allen	limestone	126,686	An-1	IM-485
Bowerston Shale Co. 1329 Seven Hills Rd. NE Newark, OH 43055 614-269-2921	Bowerston Hanover Frazeyburg	Harrison Licking Muskingum	shale shale clay	21,300 24,264 4,320	Hn-152 Lg-501 Mum-776	IM-42 IM-257 IM-256
D. H. Bowman & Sons, Inc. State Rte. 97 P.O. Box 57 Bellville, OH 44813 419-886-2711	D. H. Bowman & Sons, Inc.	Richland	sand & gravel	52,700	Rd-4	IM-279
Boyas Excavating, Inc. 4100 Brookpark Rd. Cleveland, OH 44134-1196 216-398-3900	Boyas' Valley View Quarry	Cuyahoga	sandstone	97,304	Cya-BE ³	IM-686
Boyd Gravel Co. 24270 Twp. Rd. 1202 Coshocton, OH 43812 614-622-4406	Boyd Gravel Co.	Coshocton	sand & gravel	142,299	Cn-694	IM-293

²See also Set Silica Sand, Inc.³No mine number has been assigned by the Division of Mines.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Brewer & Brewer Materials, Inc. P.O. Box 88 Chillicothe, OH 45601 614-774-4689	Brewer & Brewer Materials, Inc. N-3	Ross	sand & gravel	37,610	Rs-19	IM-594
Briar Hill Stone Co. P.O. Box 398 Glenmont, OH 44628 216-276-4011	Quarry #26 Quarry #3 Quarry #32 Quarry #24 Quarry #51 Quarry #15 Quarry #31 Quarry #6	Coshocton Coshocton Coshocton Coshocton Coshocton Coshocton Holmes Knox	sandstone sandstone sandstone sandstone sandstone sandstone sandstone sandstone	246 5,133 1,887 3,102 175 3,105 513 1,091	Cn-13 Cn-659 Cn-686 Cn-692 Cn-771 Cn-788 Hs-49 Kx-12	IM-397 IM-232 IM-504 IM-294 IM-653 IM-775 IM-418 IM-445
Briggs Sand & Gravel, Inc. R.D. 4 Box 303 Marietta, OH 45750 614-373-3363	Briggs Sand & Gravel, Inc.	Washington	sand & gravel	13,629	Wn-508	IM-57
Brimfield Sand & Gravel 1765 Far View Rd. Akron, OH 44312 216-644-3274	Brimfield Sand & Gravel	Portage	sand & gravel	26,588	Pe-80	IM-255
Broadway Sand & Gravel, Inc. 2000 Sandridge Dr. Dayton, OH 45439 513-299-1166	Broadway Sand & Gravel, Inc.	Montgomery	sand & gravel	66,638	My-65	IM-594
Brohard Mining & Development, Inc. P.O. Box 6 Pedro, OH 45659 614-532-1510	Brohard Mining & Development, Inc. Brohard Mining & Development, Inc.	Lawrence Lawrence	sand & gravel clay limestone sand & gravel clay	967 3,213 732 1,673 7,394	Le-406 Le-BMD ⁴	IM-289 IM-885
Bros. Sand & Gravel Co. P.O. Box 69 Millersburg, OH 44654 216-674-8121	Bros. Sand & Gravel Co.	Holmes	sand & gravel	76,550	Hs-82	IM-707
Broshear Gravel Co. 2520 Millville-Ross Rd. Hamilton, OH 45013 513-863-3388	Broshear Contractors, Inc.	Butler	sand & gravel	4,700	Br-48	
Brown County Highway Dept. Court House Georgetown, OH 45121 513-378-6456	Brown County Rock Crusher	Brown	limestone	5,352	Bn-1	
Karl Brugmann Sand & Gravel 8488 Weaver Rd. Ravenna, OH 44266 216-626-3914	Karl Brugmann Sand & Gravel	Portage	sand & gravel	69,084	Pe-15	IM-104
Oscar Brugmann Sand & Gravel, Inc. 3828 Dudley Rd. Mantua, OH 44255 216-274-8224	Oscar Brugmann Sand & Gravel, Inc.	Portage	sand & gravel	269,070	Pe-9	IM-119
Charles Bucklew Sand & Gravel Co. 911 County Rd. 175 Polk, OH 44866 419-869-7212	Charles Bucklew	Ashland	sand & gravel	1,822	Ald-3	IM-553
James Bunnell, Inc. 5714 State Rte. 128 Cleves, OH 45002 513-353-1100	James Bunnell, Inc.	Hamilton	sand & gravel	165,249	Hmn-59	IM-815
Burlington Sand & Gravel Co. P.O. Box 399 Chesapeake, OH 45619 614-894-5978	Burlington Sand & Gravel	Lawrence	sand & gravel	11,656	Le-426	IM-856
C.D. Materials P.O. Box 145 Garrison, KY 41141 606-757-2138	Plant #1 Alley Pit Plant 3 Pit	Fairfield Fairfield Ross	sand & gravel sand & gravel sand & gravel	3,709 1,646 2,200	Fd-1 Fd-CD ⁴ Rs-8	IM-83 IM-99 IM-122
Canton Aggregate Div. of Central Allied Enterprises, Inc. P.O. Box 1387 Station C Canton, OH 44708 216-477-6751	Canton Aggregate Canton Aggregate	Stark Stark	sand & gravel sand & gravel	463,263 147,475	Sk-681 Sk-689	IM-164 IM-173

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**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Carpenter's Excavating 4224 Fernbrook St. Kettering, OH 45440 513-299-7328	Carpenter's Excavating	Montgomery	sand & gravel	1,504	My-67	IM-725
Cedar Heights Clay Co. P.O. Box 295 Oak Hill, OH 45656-0295 614-682-7794	Cedar Heights Cedar Heights	Jackson Jackson	clay clay	7,057 2,449	Jkn-1001 Jkn-1007	
Celotex Corp. P.O. Box 280 Port Clinton, OH 43452 419-734-3153	American No. 2	Ottawa	gypsum	212,392	Oa-2	IM-344
Central Silica Co. 806 Market St. Zanesville, OH 43701 614-452-2775	Millwood Sand Division Central Silica Co.	Knox Perry	sandstone sandstone	216,693 346,223	Kx-1 Py-202	IM-269 IM-14
Chattin Concrete 9978 State Rte. 220 P.O. Box 49 Waverly, OH 45690 614-947-4677	Chattin Concrete	Pike	sand & gravel	6,175	Pke-23	IM-242
Chesterhill Stone Co. 773 East State Rte. 60 NE P.O. Box 599 McConnelsville, OH 43756 614-962-5621	Stockport Plant #2 Fultonham Plant #1 Lowell Plant #3	Morgan Muskingum Washington	sand & gravel limestone sand & gravel	258,820 570,919 16,147	Mon-588 Mum-106 Wn-56	IM-35 IM-297 IM-857
Chesterville Sand & Gravel Co., Inc. P.O. Box 51 Chesterville, OH 43317	Chesterville Sand & Gravel Co., Inc.	Morrow	sand & gravel	77,425	Mw-10	IM-258
Chief Cornstalk Sand & Gravel, Inc. 1177 Hopetown Rd. P.O. Box 464 Chillicothe, OH 45601 614-773-7479	Chief Cornstalk #1	Ross	sand & gravel	8,535	Rs-CC ⁵	IM-896
Gerald L. Christman Rte. 2 Box 110A Lewisville, OH 43754 614-838-2475	Christman Quarry	Monroe	limestone	35,000	Me-501	IM-76
Clark Clay Co. R.D. 6 Millersburg, OH 44654 216-674-5150	Clark Clay Co.	Holmes	clay	3,859	Hs-56	
Clark Gravel Co. 529 S. East St. Lebanon, OH 45036 513-932-4901	J. L. Clark Crushed Stone	Warren	sand & gravel	34,872	Wan-22	IM-324
Claycraft Co. P.O. Box 866 Columbus, OH 43216 614-866-3300	Claycraft Plant #4 & #5 Shale Pit Claycraft Plant #1 Clay Pit	Franklin Wyandot	shale clay	826,300 31,000	Fn-1 Wt-7	IM-322 IM-407
Cleveland Quarries Co. P.O. Box 261 Amherst, OH 44001-0261 216-986-4501	Birmingham Quarry Amherst Quarries	Erie Lorain	sandstone sandstone	3,970 68,653	Ee-21 Ln-3	IM-416 IM-415
Columbia Portland Cement Corp. P.O. Box 1531 Zanesville, OH 43701 614-849-2311	Lyle Quarry	Muskingum	limestone shale	562,861 44,770	Mum-24	IM-830
Con-Ag, Inc. Rte. 1 66A N St. Marys, OH 45885 419-394-8870	Con-Ag, Inc.	Auglaize	limestone	127,342	Ae-31	IM-744
Connolly Construction Co., Inc. 1146 Delaware Rd. Box 271 Marysville, OH 43040 513-644-8831	East Liberty Quarry	Logan	limestone	214,213	Lgn-1	IM-574

⁵No mine number has been assigned by the Division of Mines.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Conotton Valley Quarries Co. 40580 Cadiz-Piedmont Rd. Cadiz, OH 43907 614-942-4656	Conotton Valley Quarry	Carroll	sandstone	302	Cl-102	IM-278
Copley Sand & Gravel Co. 8650 Brookpark Rd. Cleveland, OH 44129 216-351-1100	Copley Sand & Gravel Co.	Portage	sand & gravel	35,638	Pe-84	IM-868
County Line Sand & Gravel 659 W. County Line Rd. Springfield, OH 45502 513-399-9200	County Line Sand & Gravel	Clark	sand & gravel	4,734	Ck-27	IM-549
Cravat Coal Co. 40580 Cadiz-Piedmont Rd. Cadiz, OH 43907 614-942-4656	Dover Pit	Belmont	limestone	48,673	Bt-119	IM-733
R. A. Cruise Sand & Gravel, Inc. 7639 Cleveland Rd. R.D. 4 Ravenna, OH 44266 216-296-4087	R. A. Cruise Sand & Gravel, Inc.	Portage	sand & gravel	89,530	Pe-45	IM-139
Monroe Cunningham P.O. Box 202 Wheelersburg, OH 45694 614-574-6184	Cunningham Pit	Scioto	sand & gravel	5,098	So-83	IM-211
D & J Energy, Inc. Rte. 1 Box 351 Bidwell, OH 45614 614-384-2614	D & J Energy	Jackson	limestone	120,780	Jkn-583	IM-894
D & W Sand & Gravel Co. 10677 Wren Rd. Mechanicsburg, OH 43044 513-834-3242	D & W Sand & Gravel	Champaign	sand & gravel	8,805	Cpn-21	IM-616
Davis Sand & Gravel 311 Mt. Zion Rd. SW Lancaster, OH 43130 614-687-1876	Davis Sand & Gravel	Fairfield	sand & gravel	2,339	Fd-12	IM-451
Davon, Inc. 4281 Rousch Rd. Hillsboro, OH 45133 513-393-4211	Plum Run Stone Div. Highland Stone Div.	Adams Highland	limestone limestone	555,966 257,280	Ads-1 Hd-2	IM-237 IM-230
Delphos Quarries Co. P.O. Box 67 Delphos, OH 45833 419-629-0931	Delphos Quarries Co.	Van Wert	limestone	119,720	Vt-1	IM-500
Woodrow C. Demmy 4324 Fairfield Pike Springfield, OH 45502 513-325-8840	Demmy Sand & Gravel	Clark	sand & gravel	14,646	Ck-502	IM-375
Dennis Clay Co. State Rte. 37 Box 10922 New Lexington, OH 43764 614-342-5269	Cannon Mine	Perry	clay	3,830	Py-296	IM-37
Diamond Crystal Salt Co. 2065 Manchester Rd. P.O. Box 149 Akron, OH 44309 216-745-0031	Diamond Crystal Salt Co.	Summit	salt	194,807	St-9127	
Diamond Stone Quarries, Inc. P.O. Box 66 Albany, OH 45710 614-698-2431	Plant No. 1 Plant No. 2	Athens Athens	limestone limestone	187,816 223,806	As-532 As-533	IM-16, IM-597 IM-17
A. J. Diana Sons, Inc. P.O. Box 488 Massillon, OH 44646 216-832-5904	Neidert Pit	Stark	sand & gravel	7,470	Sk-AJD ^a	IM-858
Dinnen Sand & Gravel 1991 W. Jackson Rd. Yellow Springs, OH 45387 513-325-3610	Dinnen Sand & Gravel	Clark	sand & gravel	850	Ck-501	IM-340

^aNo mine number has been assigned by the Division of Mines.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Dravo Corp. 5253 Wooster Rd. Cincinnati, OH 45226	Fairfield Plant Ross Plant Cleves Plant Camp Dennison Plant Newtown Plant Cleves Plant Apple Grove Plant South Lebanon-Oeder	Butler Butler Hamilton Hamilton Hamilton Hamilton Meigs Warren	sand & gravel sand & gravel sand & gravel sand & gravel sand & gravel sand & gravel sand & gravel sand & gravel	319,187 172,948 78,653 528,689 1,086,922 584,675 46,873 267,647	Br-14 Br-29 Hmn-3 Hmn-5 Hmn-11 Hmn-64 Ms-205 Wan-41	IM-147 IM-149 IM-137 IM-148 IM-133 IM-812 IM-30 IM-629
Dry Creek Crushed Gravel Co. 2097 Mt. Vernon Rd. Newark, OH 43055 614-366-3333	Dry Creek Crushed Gravel Co. Dry Creek Farms	Licking Licking	sand & gravel sand & gravel	58,500 49,000	Lg-7 Lg-31	IM-247 IM-246, IM-354
C. E. Duff & Son, Inc. 9042 State Rte. 117 P.O. Box 265 Huntsville, OH 43324 513-686-2488	C. E. Duff & Son, Inc. Duff Sand C. E. Duff & Son, Inc.	Logan Logan Logan	limestone sand & gravel sand & gravel	223,144 56,276 40,000	Lgn-15 Lgn-31 Lgn-39	IM-453 IM-454 IM-887
East Ohio Limestone Co. Midway Rd. Box 699 Hartsville, OH 44632 216-877-2636	East Ohio Limestone Co.	Stark	limestone clay	108,141 155	Sk-663	IM-5
Eaton Sand & Gravel Co., Inc. 1075 Eaton Dr. Covington, KY 41017 606-331-2303	Eaton Sand & Gravel Co., Inc.	Hamilton	sand & gravel	121,495	Hmn-46	IM-396
Eberhart Coal, Inc. 6406 Cleveland Ave. South East Sparta, OH 44626 216-484-4261	Eberhart Hott Strip	Tuscarawas	clay	5,838	Ts-1620	D-0013
Embro, Inc. 8320 North State Rte. 123 Franklin, OH 45005 513-746-6121	Embro, Inc.	Warren	sand & gravel	14,592	Wan-7	IM-151
Englewood Sand & Gravel Co., Inc. 501 E. Wenger Rd. Englewood, OH 45322 513-836-5121	Englewood Sand & Gravel Englewood Sand & Gravel	Montgomery Montgomery	sand & gravel sand & gravel	29,860 840	My-5 My-64	
M. T. Epling Co. 1725 Eastern Ave. Gallipolis, OH 45631 614-446-2742	M. T. Epling Sand & Gravel Plant	Gallia	sand & gravel	11,336	Ga-245	IM-238
Erie Blacktop, Inc. P.O. Box 2351 Annex Sandusky, OH 44870 419-625-7374	Erie Blacktop, Inc.	Erie	limestone	4,033	Ee-27	IM-608
Erie Sand & Steamship Co. Foot of Sassafras St. Erie, PA 16507 814-453-6721		Lake Erie	sand & gravel (dredged)	110,194		
Ernst Gravel Co. P.O. Box 440 Tipp City, OH 45371 513-667-4431	Ernst Gravel Co. Ernst Gravel Co.	Miami Shelby	sand & gravel sand & gravel	45,506 13,019	Mi-6 Shy-1	IM-356 IM-380
Feikert Sand & Gravel, Inc. R.D. 5 Box 365 Millersburg, OH 44654-9186 216-674-0038	Feikert Sand & Gravel, Inc.	Holmes	sand & gravel	91,159	Hs-511	IM-345
Ferris Coal Co., Inc. 371 South St. East Palestine, OH 44413 216-426-9680	Negley Pit	Columbiana	clay	1,249	Ca-505	
Fleckenstein Farm Gravel Pit 11251 State Rte. 66 Minster, OH 45865 513-295-2417	Fleckenstein Farm Gravel Pit	Shelby	sand & gravel	15,472	Shy-12	IM-528
Flesher Sand & Gravel 4140 Laurie Lane Norton, OH 44203 216-745-9239	Flesher Sand & Gravel	Summit	sand & gravel	37,162	St-18	IM-194

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Foureman's Sand & Gravel, Inc. 2791 Wildcat Rd. Greenville, OH 45331 513-548-1718	Foureman's Sand & Gravel, Inc.	Darke	sand & gravel	28,511	Dke-4	IM-433
The France Stone Co. P.O. Box 1928 Toledo, OH 43603 419-241-4101	Waterville Silica Paulding Bellevue Flat Rock Bloomville Custar	Lucas Lucas Paulding Sandusky Seneca Seneca Wood	limestone limestone limestone limestone limestone limestone limestone	281,875 802,443 206,081 4,998 893,705 460,695 220,226	Ls-1 Ls-3 Pg-7 Sy-6 Sa-1 Sa-3 Wd-5	IM-346 IM-347 IM-349 IM-576
Fredericktown Sand & Gravel Co. P.O. Box 112 Fredericktown, OH 43019 614-694-2096	Fredericktown Sand & Gravel Co.	Knox	sand & gravel	176,191	Kx-13	IM-343
Lyle Fuller 350 Montgomery Lane Frankfort, OH 45628 614-774-3309	Fuller Gravel	Ross	sand & gravel	200	Rs-21	
Gallia Aggregates & Construction 5347 U.S. Rte. 60E Huntington, WV 25705 304-736-0330	Gallia Aggregates & Construction	Gallia	sand & gravel	0 ⁷	Ga-244	
John L. Garber Materials, Inc. R.R. 8 Box 246 Lexington, OH 44904 419-884-1567	J. L. Garber Materials, Inc.	Richland	sand & gravel	183,133	Rd-14	IM-436
General Clay Products Corp. 1445 West Goodale Blvd. Columbus, OH 43212 216-897-7171	Drescher Pit Troyer Pit	Coshocton Holmes	clay shale shale	5,548 2,544 12,610	Cn-787 Hs-77	IM-610 IM-545
General Clay Products Corp. P.O. Box 550 Logan, OH 43138 614-385-5616	General Clay Products Corp.	Hocking	clay shale	14,049 12,411	Hg-205	IM-21
General Clay Products Corp. 9866 Mt. Eaton Rd. Wadsworth, OH 44281 216-335-1515	General Clay Products Corp.	Medina	clay shale	3,846 59,673	Ma-6	IM-455
General Portland, Inc. Peninsular Portland Cement Div. P.O. Box 160 Paulding, OH 45879 419-399-4861	Paulding Quarry	Paulding	limestone clay	459,347 87,370	Pg-1	IM-513
Gerken Materials, Inc. P.O. Box 607 Napoleon, OH 45345 419-533-2421	Gerken Materials, Inc.	Henry	sand & gravel	19,059	Hy-5	
Gibson Sand & Gravel Co. 1385 Knorr Rd. Galion, OH 44833 419-468-5527	Gibson Sand & Gravel	Crawford	sand & gravel	1,616	Cd-3	IM-693
Glandorf Tile Co. P.O. Box 79 Glandorf, OH 45848 419-538-6525	Glandorf Tile Co.	Putnam	clay	450	Pm-7	IM-487
Glen-Gery Corp. 5692 Rinker Rd. P.O. Box 398 Caledonia, OH 43314 419-845-3321	Glen-Gery Corp.	Marion	shale	63,279	Mn-7	IM-309
Goodwin Sand & Gravel, Inc. 126 S. Norton St. Mt. Vernon, OH 43050 614-392-7971	Goodwin Sand & Gravel, Inc.	Knox	sand & gravel	92,953	Kx-7	IM-235
Gottron Bros. Co. 100 South Stone St. Fremont, OH 43420 419-332-5281	Gottron Bros. Co.	Sandusky	limestone	82,707	Sy-5	IM-259

⁷No sales, production only.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Gregory Stone, Inc. 3244 S. Davis Rd. Ludlow Falls, OH 45339 513-275-7455	Gregory Quarry	Miami	limestone	3,254	Mi-16	IM-414
Groves Gravel Co. 2068 N. Troy Rd. Bellefontaine, OH 43311 513-592-6765	Groves Gravel	Logan	sand & gravel	7,513	Lgn-36	IM-581
Guernsey Limestone Co. P.O. Box 652 Marietta, OH 45750 614-373-4929	Guernsey Limestone	Washington	limestone	4,046	Wn-47	IM-62
Gwin Contracting Co. P.O. Box 205 Columbiana, OH 44408 216-482-2442	Gwin Contracting Co.	Mahoning	sandstone	137,291	Mg-62	IM-599
H & M Sand & Gravel Co. 1022 Blanchard Ave. P.O. Box 497 Findlay, OH 45840 419-422-5923	H & M Sand & Gravel Co. H & M Sand & Gravel Co.	Wyandot Wyandot	sand & gravel sand & gravel	105,629 48,010	Wt-5 Wt-15	IM-376 IM-551
Haas Gravel Co. 405 E. Wenger Rd. Englewood, OH 45332 513-836-5603	Haas Gravel Co.	Montgomery	sand & gravel	555	My-30	IM-496
J. M. Hamilton & Sons Co. 1974 Marion-Bucyrus Rd. Marion, OH 43302 614-382-2189	J. M. Hamilton & Sons Co.	Marion	limestone	87,616	Mn-2	IM-423
Hammer Clay Co., Inc. 12398 Old Bainer Rd. Roseville, OH 43777 614-697-7030	Hammer Clay Co., Inc.	Muskingum	clay	6,636	Mum-848	IM-748
Hammond Bros. 1834 S. Medina Line Rd. Copley, OH 44321 216-753-4531	Hammond Bros.	Summit	sand & gravel	800	St-39 ^a	IM-130
Hard Rocks, Inc. 9340 State Rte. 5 NE Kinsman, OH 44428 216-876-1565	Hard Rocks, Inc.	Trumbull	sandstone	69,079	Tl-13	IM-777
Hardin Quarry Co., Inc. 12484 State Rte. 701 Kenton, OH 43326 419-675-1327	Hardin Quarry Co., Inc.	Hardin	limestone	82,330	Hdn-2	IM-443
Harris Excavating Co. R.D. 1 State Rte. 113 Berlin Heights, OH 44814 419-588-2518	Harris Excavating Co.	Erie	sandstone	1,200	Ee-15	IM-708
Hartville Sand & Gravel, Inc. P.O. Box 1009 Hartville, OH 44632 216-877-9613	Hartville Sand & Gravel	Stark	sand & gravel	46,690	Sk-182	IM-67
Heiser Sand & Gravel P.O. Box 2491 North Canton, OH 44720 216-499-8201	Heiser Sand & Gravel Heiser Sand & Gravel	Stark Stark	sand & gravel sand & gravel	64,100 41,295	Sk-206 Sk-688	IM-715
Heiser Stone Co. P.O. Box 2491 North Canton, OH 44720 216-499-8201	Heiser Stone Co.	Mahoning	limestone	15,447	Mg-43	IM-723
Hillsdale Sand & Gravel, Inc. P.O. Box 223 Archbold, OH 43502 419-445-1015	Hillsdale Sand & Gravel, Inc.	Defiance	sand & gravel	1,951	De-2	IM-765
Hilltop Aggregate, Inc. P.O. Box 362 Mogadore, OH 44260 216-628-9992	Hilltop Aggregate, Inc.	Portage	sand & gravel	251,940	Pe-56	IM-127

^aSee also Jackie Lee Enterprises, Inc.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Hilltop Basic Resources, Inc. 630 Vine St. Cincinnati, OH 45202 513-299-6058	Enon Washed Sand & Gravel Co. Fairborn Aggregate Plant West Carrollton Aggregate Plant	Clark Clark, Greene Montgomery	sand & gravel sand & gravel sand & gravel	220,351 376,548 352,019	Ck-3 Ge-4 My-19	IM-463 IM-394 IM-390
Hocking County Engineers Court House Logan, OH 43138 614-385-8545	Hocking Co. Gravel Pit	Hocking	sand & gravel	14,760	Hg-296	IM-559
Hocking Valley Concrete 35255 Hocking Dr. Logan, OH 43138 614-385-2165	Hocking Valley Concrete	Hocking	sand & gravel	70,955	Hg-262	IM-41
Hollinger Gravel Plant 1977 Royer Rd. New Madison, OH 45346 513-996-6367	Hollinger Gravel Plant	Darke	sand & gravel	819	Dke-10	IM-326
Holmes Limestone Co. P.O. Box 295 Berlin, OH 44610 216-893-2721	Holmes 241 Plant	Holmes	limestone	93,741	Hs-67	IM-768
	Wayne Mine	Holmes	clay limestone	78,896 135,356	Hs-79	IM-656
Honey Creek Stone Co. P.O. Box 286 Petersburg, OH 44454 216-542-2372	Honey Creek Stone Co.	Mahoning	limestone	232,527	Mg-54	IM-93
Hornsby Sand & Gravel Co. 7450 Dryfork Rd. Cleves, OH 45002 513-367-6101	Hornsby Sand & Gravel Co.	Hamilton	sand & gravel	277,195	Hmn-45	IM-314
Warner L. Hughes, Inc. 2375 Waterloo Rd. Suffield, OH 44261 216-628-9916	Hughes Pit	Portage	sand & gravel	6,623	Pe-76	IM-678
Hugo Sand Co. 7055 State Rte. 43 Kent, OH 44240 216-673-4710	Hugo Sand Co.	Portage	sand & gravel	11,843	Pe-10	
Vivian Humphrey P.O. Box 128 Reedsville, OH 45772-0128 614-378-6295	Vivian Humphrey	Meigs	sand & gravel	160	Ms-295	
Hydraulic Press Brick Co. P.O. Box 31330 Independence, OH 44131 314-621-9306	Hydraulic Press Brick Co.	Cuyahoga	shale	166,263	Cya-19	IM-95
Indian Creek Gravel Co. 4975 College Corner Pike Oxford, OH 45056 513-523-2397	Indian Creek Sand & Gravel	Butler	sand & gravel	4,042	Br-40	IM-493
International Salt Co. P.O. Box 6920 Cleveland, OH 44101 216-651-7200	Cleveland Mine	Cuyahoga	salt	1,849,069	Cya-30	
J P Sand & Gravel Co. 5911 Lockbourne Rd. P.O. Box 2 Lockbourne, OH 43137 614-497-0083	J P Sand & Gravel Co.	Franklin	sand & gravel	406,713	Fn-52	IM-191
Jackie Lee Enterprises, Inc. 800 W. Waterloo Rd. P.O. Box 7156 Akron, OH 44306	Minor Rd. Plant	Summit	sand & gravel	65,170	St-39 ^a	IM-130
Janson Soil Services 1492 Mechanicsville Rd. Rock Creek, OH 44084 216-466-3835	Janson Soil Services	Ashtabula	sand & gravel	5,658	Asa-14	IM-563
Jefferson Materials Co. 8505 State Rte. 14 Kent, OH 44240 216-626-3816	Howitt Plant	Portage	sand & gravel	221,948	Pe-63	IM-82

^aSee also Hammond Bros.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Joseph Sand & Gravel Rte. 6 Boundary Rd. Wapakoneta, OH 45895 419-568-3787	Joseph Sand & Gravel	Auglaize	sand & gravel	12,462	Ae-23	IM-508
Kalo, Inc. 1145 Chesapeake Ave. P.O. Box 12567 Columbus, OH 43212 614-488-0736	Kalo, Inc.	Wyandot	peat	1,604	Wt-14	
John W. Karch Stone Co. P.O. Box 357 Celina, OH 45822 419-586-2335	John W. Karch Stone Co.	Mercer	limestone	255,801	Mr-1	IM-592
Karg Sand & Gravel Co. 963 Tallmadge Rd. Kent, OH 44240 216-673-1338	Karg Sand & Gravel Co.	Portage	sand & gravel	48,160	Pe-77	IM-730
Keener Sand & Clay Co. 330 Dering Ave. Columbus, OH 43207 614-444-1105	Huron Plant Gallia Plant	Erie Gallia	sand & gravel sand & gravel	2,441 1,661	Ee-5 Ga-507	IM-23
Alvin Keiffer Trucking & Excavating 296 State Rte. 604 Polk, OH 44866 419-869-7238	Dinsmore Pit	Ashland	sand & gravel	7,039	Ald-12	IM-579
King Quarries, Inc. 11300 State Rte. 340 Cumberland, OH 43732 614-638-3942	King Quarries, Inc.	Noble	limestone	218,751	Ne-106	IM-85
Kinsman Sand & Gravel Co. 9443 State Rd. Kinsman, OH 44428 216-876-3321	Kinsman Sand & Gravel Co.	Ashtabula, Trumbull	sand & gravel	188,272	Tl-9	IM-724, IM-886
Kipp's Gravel Co., Inc. 4987 State Rte. 222 Batavia, OH 45103 513-732-1024	Kipp's Gravel Co., Inc.	Clermont	sand & gravel	60,930	Ct-7	IM-432
Kirby's Sand & Gravel, Inc. 4876 Twp. Hwy. 43 Rte. 4 Upper Sandusky, OH 43351 419-927-2260	Kirby's Sand & Gravel	Wyandot	sand & gravel	46,323	Wt-17	IM-604
Kohl Industries Rte. 4 New Philadelphia, OH 44662 216-343-5231	Black Hawk Mine	Stark	limestone clay shale	179,181 20,808 603,000	Sk-217	IM-750
Edward Kraemer & Sons, Inc. Bolander Rd. Clay Center, OH 43408 419-855-8388	White Rock Quarry	Ottawa	limestone	652,718	Oa-6	IM-296
L & I Trucking & Construction, Inc. 1842 Adams Rd. Loveland, OH 45140 513-683-2045	L & I Trucking & Construc- tion, Inc.	Warren	sand & gravel	88,740	Wan-8	IM-240
L & M Excavators 2191 Snouffer Rd. Worthington, OH 43085 614-885-7897	Westerville Industrial Park	Franklin	sand & gravel	23,141	Fn-54	IM-847
L & M Minerals, Inc. P.O. Box 54 Millersburg, OH 44654 216-893-2227	Evans Luikert	Tuscarawas Tuscarawas	clay shale clay shale	10,414 60,242 22,131 10,967	Ts-1884 Ts-1914	IM-6 IM-741
Lake Hope Asphalt, Inc. Rte. 278 Box 38 Nelsonville, OH 45764 614-753-1005	Lake Hope Asphalt, Inc.	Athens	sand & gravel	20,313	As-1161	IM-97
Lakeside Sand & Gravel Co. 3431 Frost Rd. Mantua, OH 44255 216-274-2569	Lakeside Sand & Gravel	Portage	sand & gravel	55,882	Pe-40	IM-190

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Latham Limestone, Inc. P.O. Box 77 Latham, OH 45646 614-493-2677	Rogers Quarry	Pike	limestone	204,840	Pke-13	IM-213
Lingvai Peat Co. R.R. 2 Box 107 Edgerton, OH 43517 419-298-2058	Lingvai Peat Pit	Williams	peat	242	Ws-17	
Lintner & Luft, Inc. 2891 14th Ave. Columbus, OH 43219 614-252-1522	Lintner & Luft, Inc. Quarry	Seneca	limestone	2,643	Sa-8	IM-313
Lone Star-Marquette P.O. Box 8 Pedro, OH 45659 614-532-4163	Bear Run	Lawrence	shale	47,895	Le-308	IM-31
Lucky Sand & Gravel Co. 12018 Frost Rd. Mantua, OH 44255 216-562-6196	Lucky Sand & Gravel Co.	Portage	sand & gravel	123,366	Pe-75	IM-154
Ludlow Stone, Inc. 3244 S. Davis Rd. Ludlow Falls, OH 45339 513-698-3043	Ludlow Stone, Inc.	Miami	limestone	226,684	Mi-502	IM-414
MacRitchie Materials, Inc. P.O. Box 90 West Millgrove, OH 43467 419-288-2790	MacRitchie Materials, Inc.	Wood	limestone	192,845	Wd-1	IM-548
Marshall Quarry, Inc. 11199 State Rte. 124 Hillsboro, OH 45133 614-466-2560	Marshall Quarry, Inc.	Highland	limestone	7,611	Hd-4	IM-406
Martin Farms, Inc. 2993 Woodsdale Rd. Trenton, OH 45067 513-988-6318	Martin Farms, Inc.	Butler	sand & gravel	67,162	Br-52	IM-814
Martin Marietta Chemicals Executive Plaza on II Hunt Valley, MD 21030 301-667-0200	Woodville Quarry	Sandusky	limestone	1,744,675	Sy-1	IM-537
Masons Sand & Gravel Co. 2385 Rathmell Rd. Columbus, OH 43207 614-491-3611	Masons Sand & Gravel	Franklin	sand & gravel	69,065	Fn-11	IM-234
Massillon Washed Gravel Co. 6331 Blough Ave. SW P.O. Box 167 Navarre, OH 44662 216-879-2132	Massillon Washed Gravel Co.	Stark	sand & gravel	207,846	Sk-607	IM-102
Maumee Haulers, Inc. 8647 Nebraska Ave. Toledo, OH 43617 419-865-5013	Nebraska Pit	Lucas	sand & gravel	154,946	Ls-20	IM-800
Maumee Stone Co. 221 Allen St. P.O. Box 29A Maumee, OH 43537 419-893-8731	Maumee Stone Co. Rocky Ridge Auglaize Scott South Montpelier	Lucas Ottawa Paulding Van Wert Williams	limestone limestone limestone limestone sand & gravel	699,986 139,658 221,464 333,489 194,965	Ls-2 Oa-14 Pg-2 Vt-3 Ws-6	IM-503 IM-320 IM-481 IM-495 IM-497
	Maumee Stone Co. Portage	Wood Wood	limestone limestone	413,790 77,034	Wd-6 Wd-11	IM-480 IM-475
Maxville Stone Co. 7957 State Rte. 668 S Logan, OH 43138 614-596-5221	Maxville Stone Co.	Perry	limestone	45,182	Py-235	IM-17, IM-515
Charles H. McCarthy Quarry 6326 County Rd. 61 Upper Sandusky, OH 43351 419-294-2611	McCarthy Stone Quarry	Wyandot	limestone	100,570	Wt-3	IM-298

¹⁰Limestone sales only, no production. Limestone shipped in for sale.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
McCoy Clay Co. Rte. 2 Box 111 South Webster, OH 45682 614-778-3236	McCoy Clay Co.	Scioto	clay	2,500	So-94	IM-201
Mecco, Inc. 2504 S. Main St. Middleton, OH 45042 513-422-3651	Mecco, Inc.	Butler	sand & gravel	29,926	Br-15	IM-316
Mechanicsburg Sand & Gravel, Inc. P.O. Box 18 Mechanicsburg, OH 43044 513-834-2606	Mechanicsburg Sand & Gravel, Inc.	Champaign	sand & gravel	44,774	Cpn-22	IM-889
Melvin Stone Co. 228 Melvin Rd. Wilmington, OH 45177 513-584-2486	Melvin Stone Co.	Clinton	limestone	334,300	Cln-1	IM-241
Mesenburg Bros., Inc. R.D. 1 Collins, OH 44826 419-668-5691	Mesenburg Bros., Inc. Mesenburg Bros., Inc.	Erie Huron	sand & gravel sandstone	12,582 14,167	Ee-24 Hrn-8	IM-268
Miami Gravel Co. R.D. 2 Chillicothe, OH 45601 614-453-0721	Muskingum River Gravel Plant #7	Ross	sand & gravel	47,636	Rs-4	IM-663
Miami River Stone Co. 1556 Miami River Rd. Sidney, OH 45365 513-492-5412	Miami River Stone Co. Miami River Stone Co.	Shelby Shelby	limestone sand & gravel	248,617 1,916	Shy-6 Shy-17	IM-378 IM-728
Mickley Gravel Co. P.O. Box J Danville, OH 43014 614-599-7870	Mickley Gravel Co.	Knox	sand & gravel	575	Kx-5	IM-884
Middletown Sand & Gravel Co. P.O. Box 368 Middletown, OH 45042 513-422-3781	Middletown Sand & Gravel Co.	Butler	sand & gravel	75,291	Br-1	IM-180
Miller Bros. Clay Works, Inc. Lock Box 162 Ottoville, OH 45876 419-453-3545	Miller Bros. Clay Works, Inc.	Putnam	clay	1,500	Pm-9	
Miller Bros. Gravel, Inc. 7900 S. Kessler-Frederick Rd. Tipp City, OH 45371 513-836-0981	Miller Bros. Gravel, Inc.	Montgomery	sand & gravel	139,814	My-52	IM-348
H. M. Miller Construction Co. 1225 Waterloo Rd. P.O. Box 131 Mogadore, OH 44260 216-628-4811	Krumroy Pit	Summit	sand & gravel	6,759	St-46	IM-557
Miller Sand & Gravel Co. State Rte. 82 Box 60 Windham, OH 44288 216-326-3157	Miller Sand & Gravel	Portage	sand & gravel	5,883	Pe-39	IM-74
Miller Sand Co. 4615 Bellevue-Castalia Rd. Castalia, OH 44824 419-684-7180	Miller Sand Co.	Erie	sand & gravel	5,648	Ee-28	IM-601
Mohican Sand & Gravel, Inc. P.O. Box 28 Perrysville, OH 44864 419-522-2521	Lucas Pit & Mill	Richland	sand & gravel	83,822	Rd-5	IM-674
Montgomery Sand Co. Rte. 1 Plymouth, OH 44865 419-687-5081	Montgomery Sand Co.	Huron	sand & gravel	853	Hrn-9	
Moore's Excavating Co. 2222 N. Rte. 68 Urbana, OH 43078 513-653-6288	Moore's Excavating Co.	Champaign	sand & gravel	70,731	Cpn-20	IM-482

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Moorman Sand & Gravel Co. 6127 Germantown Rd. Box 422 Middletown, OH 45042 513-424-1243	Moorman Sand & Gravel Co.	Butler	sand & gravel	121,468	Br-6	IM-177, IM-181
Morrison Gravel Co. 4462 Higby Rd. Chillicothe, OH 45601 614-884-4777	Morrison Sand & Gravel	Ross	sand & gravel	14,810	Rs-12	IM-560
Morton Thiokol, Inc. Morton Salt Division P.O. Box 390 Painesville, OH 44077-0390 216-354-9901	Fairport Mine	Lake	salt	1,365,014	Lke-6	
Morton Thiokol, Inc. Morton Salt Division 151 S. Industrial St. Rittman, OH 44270-1593 216-925-3015	Morton Salt Well Field	Wayne	salt	404,797	We-9129	
Muskingum River Gravel Co. P.O. Box 14 Lockbourne, OH 43137 614-453-0721	Plant #6 Plant #8 Plant #1 Plant #4 Plant #2 Plant #5	Franklin Hocking Muskingum Muskingum Washington Washington	sand & gravel sand & gravel sand & gravel sand & gravel sand & gravel sand & gravel	29,450 53,111 70,120 45 3,721 1,929	Fn-24 Hg-301 Mum-736 Mum-786 Wn-38 Wn-52	IM-266 IM-458 IM-804 IM-422 IM-701 IM-552
National Lime & Stone Co. P.O. Box 120 Findlay, OH 45840 419-422-4341	Lima Plants Buckland Plant Wapak Sand & Gravel Bucyrus Plant Delaware Plant Findlay Plant Marion Plant Carey Plant	Allen Auglaize Auglaize Crawford Delaware Hancock Marion Wyandot	limestone limestone sand & gravel limestone limestone limestone limestone limestone	712,321 260,574 277,402 842,637 579,402 530,823 417,301 1,584,541	An-3 Ae-10 Ae-30 Cd-1 Del-5 Hk-1 Mn-3 Wt-1	IM-540 IM-486 IM-404 IM-207 IM-483 IM-168 IM-405
Neer's Engineering Laboratories 4859 Twp. Rd. 45 Bellefontaine, OH 43311 513-585-6733	Neer's Engineering Laboratories	Logan	sand & gravel	99,693	Lgn-6	IM-459
Neiheisel Sand & Gravel P.O. Box 255 Columbiana, OH 44408 216-427-2824	Leetonia Pit & Mill Neiheisel Sand & Gravel	Columbiana Mahoning	sand & gravel sand & gravel	9,907 6,816	Ca-600 Mg-NSG ¹¹	IM-100 IM-808
Nelson Sand & Gravel, Inc. Logan Dr. Ashtabula, OH 44004 216-224-0198	Nelson Sand & Gravel, Inc.	Ashtabula	sand & gravel	23,200	Asa-11	IM-160
New Carlisle Sand & Gravel Co. 6090 South Scarff Rd. New Carlisle, OH 45344 513-845-0696	New Carlisle Sand & Gravel Co.	Miami	sand & gravel	855	Mi-501	
New Miami Sand & Gravel 151 Seven Mile Ave. New Miami, OH 45011 513-863-7676	New Miami Sand & Gravel	Butler	sand & gravel	71,617	Br-3	IM-719
Northern Ohio Materials, Inc. 35746 Lake Shore Blvd. Eastlake, OH 44094 216-946-8467	Northern Ohio Materials, Inc. Northern Ohio Materials, Inc.	Portage Summit	sand & gravel sand & gravel	24,211 57,499	Pe-85 St-41	IM-700 IM-113
Northmont Sand & Gravel Co. P.O. Box 185 Englewood, OH 45322 513-836-1998	Northmont Sand & Gravel Co.	Montgomery	sand & gravel	38,611	My-49	IM-370
Northwood Stone & Asphalt Co. 1558 County Rd. 105 Belle Center, OH 43310 513-464-3833	Northwood Stone & Asphalt Co.	Logan	limestone	65,293	Lgn-2	IM-494
Ohio Asphaltic Limestone Corp. 8591 Mad River Rd. Hillsboro, OH 45133 513-364-2191	Ohio Asphaltic Limestone Corp.	Highland	limestone	151,733	Hd-3	IM-243

¹¹No mine number has been assigned by the Division of Mines.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Ohio Foundry Sand Co. 330 Dering Ave. Columbus, OH 43207 614-444-1105	Shinrock Plant	Erie	sand & gravel	2,078	Ee-13	IM-285
Ohio Lime Co. 3964 County Rd. 41 Millersville, OH 43448 419-638-2511	Plant #3	Sandusky	limestone	512,357	Sy-4	IM-282, IM-381
Olen Corp. 1018 Proprietors Rd. Worthington, OH 43085 614-885-4220	Olen Corp.	Franklin	sand & gravel	369,194	Fn-43	IM-188, IM-189
Oneida Sand & Gravel, Inc. 8000 Blade Rd. Malvern, OH 44644 216-343-6831	Oneida Sand & Gravel, Inc.	Carroll	sand & gravel	83,797	Cl-204	IM-554
Osborne Materials Co. Williams St. P.O. Box 217 Grand River, OH 44045		Lake Erie	sand & gravel	84,602		
Oster Sand & Gravel, Inc. 5947 Whipple Rd. NW North Canton, OH 44720 216-494-5472	Oster Sand & Gravel, Inc. Oster Sand & Gravel, Inc.	Stark Tuscarawas	sand & gravel sand & gravel	169,145 129,470	Sk-165 Ts-1852	IM-192, IM-781 IM-75
Ottawa Stone Co., Inc. P.O. Box 27 Ottawa, OH 45875 419-456-3261	Ottawa Stone Co.	Putnam	limestone	11,767	Pm-3	IM-535
Owens Stone Co., Inc. R.D. 1 Ostrander, OH 43061 614-666-7555	Owens Stone Co.	Delaware	limestone	372,760	Del-3	IM-327
Parker Sand & Stone, Inc. 1750 S. Eber Rd. (B) Holland, OH 43528 419-866-5886	Rte. 295 Pit Angola Road Pit	Lucas Lucas	sand & gravel sand & gravel	10,168 19,521	Ls-21 Ls-22	IM-804 IM-955
Partin Sand & Gravel 4252 Taylorsville Rd. Dayton, OH 45424 513-233-9501	Partin Sand & Gravel	Montgomery	sand & gravel	200	My-55	IM-571
R. H. Penick 1504 Blue Jay Rd. Heath, OH 43056 614-323-3040	Penick	Licking	salt	11,089	Lg-45	
Pennsylvania Glass Sand Corp. P.O. Box 187 Berkeley Springs, WV 25411	Coxey Works	Tuscarawas	sandstone	47,047	Ts-1660	IM-79
Penry Stone Co. P.O. Box 176 Radnor, OH 43066 614-595-3473	Penry Stone Co. Penry Stone Co.	Delaware Marion	limestone sand & gravel	334,624 62,964	Del-2 Mn-4	IM-299 IM-290
Phillips Sand & Gravel P.O. Box 71 Alpha, OH 45301 513-426-5461	Phillips Sand & Gravel	Greene	sand & gravel	295,353	Ge-36	IM-305
Pifer Stone Co. P.O. Box 101 Williamstown, OH 45897 419-365-5078	Pifer Stone Co.	Hancock	limestone	18,090	Hk-4	IM-489
C. F. Poeppelman Sand & Stone, Inc. 4755 N. State Rte. 721 Bradford, OH 45308 513-448-2613	C. F. Poeppelman, Inc.	Miami	limestone	110,852	Mi-10	IM-335
Portage Lakes Sand & Gravel Co. 2800 N. Turkeyfoot Rd. Akron, OH 44319 216-644-2285	Portage Lakes Sand & Gravel Co. Plant #4	Summit	sand & gravel	179,037	St-33	IM-121

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Prairie Lane Sand & Gravel Co. 4401 Prairie Lane Rd. Wooster, OH 44691 216-262-6821	Prairie Lane Sand & Gravel Co.	Wayne	sand & gravel	171,760	We-11	IM-547
Price Companies, Inc. 115 Jefferson St. Norwalk, OH 44857 419-668-1059	Price Sand & Gravel Pit #1	Huron	sand & gravel	63,120	Hrn-1	
Purdy Sand & Gravel Co. 14220 Parrott St. Ext. P.O. Box 667 Mt. Vernon, OH 43050 614-397-0000	Purdy Sand & Gravel Co.	Knox	sand & gravel	65,737	Kx-3	IM-300
Puskarich Limestone Co. 40580 Cadiz-Piedmont Rd. Cadiz, OH 43907 614-942-4656	Puskarich Limestone Co.	Carroll	limestone	125,966	Cl-183	IM-7
Putnam Stone Co., Inc. R.D. 1 7053 Road M Ottawa, OH 45875-9754 419-523-6004	Putnam Stone Co.	Putnam	limestone	149,927	Pm-2	IM-570
Quality Ready Mix, Inc. R.R. 5 Box 12 Wapakoneta, OH 45895 419-738-6010	Quality Pit	Auglaize	sand & gravel	12,000	Ae-16	IM-595
Queen City Gravel Co. 5050 Orchard St. Cincinnati, OH 45212 513-531-6214	Queen City Gravel Co.	Hamilton	sand & gravel	5,297	Hmn-16	IM-272
R & R Aggregates, Inc. P.O. Box 863 Chillicothe, OH 45601 614-774-6700	R & R Aggregates, Inc.	Ross	sand & gravel	10,232	Rs-23	IM-875
George L. Rack, Inc. 5175 Este Ave. Cincinnati, OH 45232 513-242-5052	George L. Rack, Inc.	Hamilton	sand & gravel	61,515	Hmn-10	IM-226
Raleigh Spradlin Gravel Co. 622 Swackhammer Rd. Circleville, OH 43113 614-474-6722	John N. Bowers Pit	Pickaway	sand & gravel	16,743	Pky-2	IM-565
Rialto Sand & Gravel 1690 Owens Rd. W Marion, OH 43302 614-387-6754	Rialto Sand & Gravel	Marion	sand & gravel	150	Mn-17	IM-460
Richards & Son, Inc. P.O. Box 232 Pomeroy, OH 45769 614-247-2311	Richards & Son, Inc.	Meigs	sand & gravel	565,637	Ms-298	IM-32
Ridge Township Quarry R.R. 1 Box 263 Van Wert, OH 45891 419-238-2533	Ridge Township Quarry	Van Wert	limestone	59,963	Vt-7	IM-642
Ries Sand & Gravel 169 State Rte. 95 Jeromesville, OH 44840 419-368-7833	Ries Sand & Gravel	Ashland	sand & gravel	11,142	Ald-9	IM-745
Riverside Sand & Gravel Co., Inc. P.O. Box 324 Tallmadge, OH 44278 216-673-2021	Riverside Sand & Gravel (Acken)	Summit	sand & gravel	54,348	St-24	IM-239
Rockford Stone Co. 3491 U.S. Rte. 33 Rockford, OH 45882 419-363-3392	Rockford Stone Co.	Mercer	limestone	61,005	Mr-2	IM-430
L. G. Rockhold & Sons, Inc. 28541 State Rte. 739 West Mansfield, OH 43358 513-358-2224	L. G. Rockhold & Sons, Inc.	Union	limestone	132,356	Un-1	IM-208

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Rockport Sand & Gravel Co., Inc. 9215 Rock St. Columbus Grove, OH 45830 419-358-5846	Pit #1 Pit #2	Allen Allen	sand & gravel sand & gravel	45,881 34,950	An-14 An-15	IM-523 IM-721
Romany Ceramics, Inc. 19233 Sandyville Rd. SE East Sparta, OH 44626 216-866-5531	Romany Ceramics, Inc.	Stark	shale	9,181	Sk-170	IM-365
Ross Aggregates, Inc. 1234 Boel Dr. P.O. Box 611 Kent, OH 44240 216-673-2939	Spies Property	Stark	sand & gravel	73,859	Sk-210	IM-752, IM-811
Rubber City Sand & Gravel Co. P.O. Box 7126 Akron, OH 44306 216-699-3311	Knight Plant	Summit	sand & gravel	9,257	St-9	IM-167
Rupp Construction, Inc. 18228 Fulton Rd. Marshallville, OH 44645 216-855-2781	Rupp	Wayne	sand & gravel	219,996	We-7	IM-471
SME Bessemer, Inc. P.O. Box 790 New Castle, PA 16103 216-499-9100	Quarry #8	Mahoning	limestone clay shale	1,820,328 9,285 134,457	Mg-608	IM-4
SME Cement, Inc. 8282 Middle Rd. Middlebranch, OH 44562 216-499-9100	#3 Pit	Stark	limestone	864	Sk-222	IM-960
Salt Creek Materials 880 Spry Rd. Zanesville, OH 43701 614-872-3860	Salt Creek Materials	Muskingum	sand & gravel	18,455	Mum-216	IM-689
Sandkuhl Tile Co. R.D. 1 Spencerville, OH 45887 419-647-4131	Sandkuhl Tile Co.	Auglaize	clay	3,805	Ae-7	
Sandusky Crushed Stone Co., Inc. P.O. Box 527 Sandusky, OH 44870 419-625-8493	Sandusky Crushed Stone Co., Inc.	Erie	limestone	1,964,877	Ee-11	IM-263
The Schloss Paving Co. 13700 McCracken Rd. Cleveland, OH 44125 216-587-4900	Schloss Paving Co.	Portage	sand & gravel	109,383	Pe-60	IM-78
J. J. Scott Co. 153 North Gambel Shelby, OH 44875	Ganges Gravel	Richland	sand & gravel	369	Rd-18	
Seaway Sand & Stone, Inc. 2190 Whitehouse-Spencer Rd. Swanton, OH 43558 419-865-5751	Seaway Sand & Stone	Lucas	sand & gravel	198,187	Ls-13	IM-492
Set Silica Sand, Inc. 8501 Freeway Dr. Macedonia, OH 44056 216-831-5500	Set Silica Sand, Inc.	Geauga	sandstone	35,344	Gea-36 ¹²	IM-337
Seville Sand & Gravel, Inc. P.O. Box 54 Seville, OH 44273 216-948-1812	Seville Sand & Gravel, Inc.	Medina	sand & gravel	336,266	Ma-22	IM-650, IM-651
R. W. Sidley, Inc. 615 W. Main Rd. Conneaut, OH 44030 216-298-3232	Conneaut Plant	Ashtabula	sand & gravel	13,820	Asa-15	IM-783
R. W. Sidley, Inc. 7123 Madison Rd. Thompson, OH 44086 216-298-3232	R. W. Sidley, Inc. Sandstone Quarry Painesville Plant	Geauga Lake	sandstone sand & gravel	229,905 45,613	Gea-1 Lke-7	IM-163 IM-162

¹²See also Walter C. Best, Inc.

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Sidney Sand & Gravel Co. P.O. Box 379 Sidney, OH 45365 513-492-3125	Milligan & Milligan-Washington Twp. Pit	Shelby	sand & gravel	117,439	Shy-13	IM-412
	Rock Run Quarry	Shelby	limestone	24,993	Shy-16	IM-411
Sidwell Bros., Inc. 4620 Limestone Valley Rd. Zanesville, OH 43701 614-849-2392	Sidwell Quarry #3	Morgan	limestone	23,398	Mon-600	IM-281
	Sidwell Quarry	Muskingum	limestone	453,696	Mum-104	IM-277
	Sidwell Quarry #2	Muskingum	limestone	190,267	Mum-896	IM-301
Silver Arrow Systems, Inc. 7730 Bond St. Solon, OH 44139 216-439-3100	Silver Arrow Systems, Inc.	Cuyahoga	sand & gravel	67,202	Cya-26	IM-683
Simanton Sand Co. P.O. Box 387 Norwalk, OH 44857 419-668-2952	Simanton Sand Co.	Ashland	sand & gravel	34,888	Ald-11	IM-543
Skidmore & Chah, Inc. 2312 Aetna Rd. Box 396 Ashtabula, OH 44004 216-998-1255	Amboy Pit	Ashtabula	sand & gravel	1,600	Asa-13	IM-785
Small's Sand & Gravel, Inc. 20420 Zion Rd. P.O. Box 617 Gambier, OH 43022 614-427-4096	Small's Sand & Gravel, Inc.	Knox	sand & gravel	162,006	Kx-8	IM-267
Sober Sand & Gravel Co. 2898 Tallmadge Rd. Ravenna, OH 44266 216-325-7013	Sober Sand & Gravel Co.	Portage	sand & gravel	330	Pe-18	IM-193
Soehnlén Sand & Gravel Co. R.D. 1 Beach City, OH 44608 216-756-2244	Soehnlén Bros. Sand & Gravel	Tuscarawas	sand & gravel	40,937	Ts-1826	IM-88
Solon Excavators Sand & Gravel, Inc. 3583 Frost Rd. Mantua, OH 44255 216-274-8241	Solon Excavators Sand & Gravel, Inc.	Portage	sand & gravel	186,965	Pe-36	IM-90
Southern Silica, Inc. P.O. Box 22 Richmond Dale, OH 45673 614-884-4721	Southern Silica, Inc.	Ross	sandstone	280,985	Rs-16	IM-172
Southwestern Portland Cement Co. Eastern Division 506 E. Xenia Rd. P.O. Box 191 Fairborn, OH 45324 513-878-8651	Southwestern Portland Cement Co.	Greene	limestone	712,227	Ge-1	IM-330
	Southwestern Portland Cement Co.	Greene	clay	136,901	Ge-8	
	Southwestern Portland Cement Co.	Montgomery	limestone	45,384	My-58	
Sphagnum Moss Peat Farm 9797 Thompson Rd. West Liberty, OH 43357 513-653-7337	Sphagnum Moss Peat Farm	Champaign	peat	6,776	Cpn-9	
Spring Creek Corp. 4723 Hardin-Wapak Rd. Sidney, OH 45365 513-492-9697	Pence Drag Strip	Shelby	sand & gravel	187,906	Shy-11	IM-743
	Quarry Deposit	Shelby	limestone	58,346	Shy-15	IM-387
	Jones Deposit	Shelby	sand & gravel	1,000	Shy-18	IM-388
Spring Industries P.O. Box 507 New Philadelphia, OH 44663 216-339-3585	Newcomerstown Plant	Coshocton	sand & gravel	16,219	Cn-624	IM-243
	Sandyville Pit	Tuscarawas	sand & gravel	303	Ts-515	
	Midvale Pit	Tuscarawas	sand & gravel	292,356	Ts-1771	IM-77
	County Line Plant	Tuscarawas	sand & gravel	1,266	Ts-1788	IM-73
Springfield Sand & Gravel Co. 4301 S. Charleston Pike Springfield, OH 45502 513-325-7386	Springfield Sand & Gravel Co.	Clark	sand & gravel	259,143	Ck-25	IM-358
Standard Slag Co. 1200 Stambaugh Bldg. P.O. Box 1378 Youngstown, OH 44501 216-743-3151	Adams Forest	Adams	limestone	190,732	Ads-6	IM-659
	Marblehead	Hardin	limestone	10,496	Hdn-1	IM-488
	Cutlip	Ottawa	limestone	915,228	Oa-7	IM-440
	Shalersville	Pike	sand & gravel	271,002	Pke-24	IM-222
	Haverhill	Portage	sand & gravel	622,299	Pe-68	IM-143
		Scioto	sand & gravel	228,506	So-79	IM-221

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Statewide Landfill Co. 1401 Timken Place SW Canton, OH 44706 216-452-7717	Statewide Landfill Co.	Stark	clay	8,000	Sk-219	IM-602
Steetly Resources, Inc. Main St. Woodville, OH 43469 419-849-2321	Ohio Lime Co.	Sandusky	limestone	746,953	Sy-8	
Stewart & Reichman, Inc. Rte. 1 Box 64 Gnadenhutten, OH 44629 614-922-0050	Stewart & Reichman, Inc.	Tuscarawas	sand & gravel	32,045	Ts-111	IM-55
Stocker Sand & Gravel Co. P.O. Box 176 Gnadenhutten, OH 44629 614-254-4635	Stocker Sand & Gravel Co. Stocker Sand & Gravel Co.	Tuscarawas Tuscarawas	sand & gravel sand & gravel	291,243 253,606	Ts-69 Ts-125	IM-51 IM-50
Stone Creek Brick Co. P.O. Box 116 Stone Creek, OH 43840 216-339-5511	Stone Creek Brick Co. Clay Mine Stone Creek Brick Co. Shale Mine	Tuscarawas Tuscarawas	clay shale	52,210 6,452	Ts-1557 Ts-1558	IM-38 IM-52
Sturm & Dillard Co. P.O. Box 107 Circleville, OH 43113 614-837-9067	Sturm & Dillard Co.	Pickaway	sand & gravel	291,240	Pky-1	IM-409, IM-428, IM-668
Suever Stone Co., Inc. P.O. Box 269 Delphos, OH 45833 419-692-9796	Suever Stone Co., Inc.	Allen	limestone	71,236	An-4	IM-491
Sugar Creek Stone Quarry, Inc. P.O. Box 584 Washington Court House, OH 43160-0637 614-335-6301	Sugar Creek Stone Quarry, Inc.	Fayette	limestone	84,434	Fe-3	IM-329
Sugarcreek Clay & Limestone, Inc. P.O. Box 402 Sugarcreek, OH 44681 216-852-4440	Sugarcreek Clay & Limestone, Inc.	Tuscarawas	limestone clay shale	51,151 1,002 919	Ts-1928	IM-98
Summitville Tiles, Inc. Summitville, OH 43962 216-223-1511	Summitville Tiles, Inc.	Columbiana	shale	68,737	Ca-205	IM-74
T & J Sand & Gravel, Inc. 7450 Dryfork Rd. Cleves, OH 45002 513-367-6101	T & J Sand & Gravel, Inc.	Hamilton	sand & gravel	84,381	Hmn-58	IM-840
Tarbox-McCall Stone Co. Div. of Hancock Ready Mix, Inc. 852 Western Ave. Findlay, OH 45840 419-422-1912	Tarbox-McCall Stone Co.	Hancock	limestone	194,499	Hk-2	IM-439
Terra Vista Sand & Gravel 11201 Tinkers Creek Rd. Cleveland, OH 44125 216-464-0903	Terra Vista Sand & Gravel	Cuyahoga	sand & gravel	12,000	Cya-31	IM-603
Three Rivers Sand & Gravel, Inc. 400 Cooper Ave. Cleves, OH 45002 513-241-2929	Three Rivers Sand & Gravel, Inc.	Hamilton	sand & gravel	17,032	Hmn-28	IM-353
Tipp Sand & Gravel Co. P.O. Box 367 Troy, OH 45373 513-890-4051	Tipp Sand & Gravel Co.	Montgomery	sand & gravel	84,065	My-61	IM-468
Tri-County Limestone Co. 4664 Hardin-Marion Rd. Kenton, OH 43326 419-675-7127	Tri-County Limestone Co.	Marion	limestone	100,518	Mn-1	IM-250
Tri-State Asphalt Products P.O. Box 160 Martins Ferry, OH 43935 614-633-2331	Tri-State Asphalt Products	Belmont	sand & gravel	501,310	Bt-74	IM-502
Trout Sand & Gravel Co. Rte. 4 Marietta, OH 45750 614-373-7471	Trout Sand & Gravel Co.	Washington	sand & gravel	37,326	Wn-510	IM-25

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Troy Gravel Co. P.O. Box 440 Tipp City, OH 45371 513-667-4431	Troy Gravel Co.	Miami	sand & gravel	169,848	Mi-3	IM-462
Twin Lakes Sand, Inc. 2307 State Rte. 303 Streetsboro, OH 44240 216-626-3016	Shalersville Streetsboro Arlington Barberton	Portage Portage Summit Summit	sand & gravel sand & gravel sand & gravel sand & gravel	120,806 62,045 2,424 42,983	Pe-59 Pe-67 St-32 St-44	IM-210 IM-202 IM-203 IM-178
Union Aggregates Co. 8328 Watkins Rd. P.O. Box 178 Ostrander, OH 43061 614-666-5841	Prospect Sand & Gravel Plant Green Camp Gravel Plant Union Limestone Plant	Marion Marion Union	sand & gravel sand & gravel limestone	59,740 7,612 413,721	Mn-10 Mn-12 Un-2	IM-196 IM-197 IM-236
Union Slag Corp. P.O. Box 652 Marietta, OH 45750 614-373-5436	Union Slag Plant #3 Union Slag Plant #2	Washington Washington	sand & gravel sand & gravel	22,394 33,906	Wn-43 Wn-44	IM-61 IM-63
USG Industries, Inc. 21880 W. State Rte. 163 Genoa, OH 43430 419-855-8336	USG Industries, Inc.	Ottawa	limestone	317,697	Oa-1	IM-292
Valley Gravel Co. P.O. Box 440 Tipp City, OH 45371 513-667-4431	Valley Gravel Co.	Miami	sand & gravel	145,069	Mi-8	IM-355
Van Wey Sand & Gravel, Inc. 6824 Mt. Vernon Rd. NE Newark, OH 43055 614-745-5965	Van Wey Sand & Gravel, Inc.	Licking	sand & gravel	181,912	Lg-10	IM-217
Wagner Quarries Co. 4203 Milan Rd. Sandusky, OH 44870 419-625-8141	Soldiers Home Quarry	Erie	limestone	1,138,107	Ee-1	IM-310
Waller Bros. Stone Co. P.O. Box 157 McDermott, OH 45652 614-259-2356	Inskeep Quarry Crabtree Quarry Miller Quarry	Scioto Scioto Scioto	sandstone sandstone sandstone	1,900 950 560	So-48 So-76 So-82	IM-140 IM-141 IM-158
Wapak Sand & Gravel Co. 711 Frank Rd. Columbus, OH 43223 419-586-4228	Agg Rok	Franklin	sand & gravel	334,358	Fn-36	IM-302
Waterloo Coal Co., Inc. P.O. Box 177 Oak Hill, OH 45656 614-682-7787	Zoar	Jackson	limestone clay	530,908 77,228	Jkn-367	IM-774, D-0163, D-0273, D-0286
Watson Gravel, Inc. P.O. Box 277 Ross, OH 45061 513-863-0070	Watson Pit Harrison Pit Mason Pit	Butler Hamilton Warren	sand & gravel sand & gravel sand & gravel	573,698 525,267 521,160	Br-47 Hmn-60 Wan-10	IM-111 IM-761 IM-465
Weaver's Peat Co. c/o Weaver's Lawn & Garden Products, Inc. P.O. Box 333 Bowling Green, OH 43402 419-352-8429	Weaver's Peat Co.	Logan	peat	12,070	Lgn-33	
Weber Sand & Gravel P.O. Box 116 Reedsville, OH 45772 614-378-6293	Weber Sand & Gravel	Meigs	sand & gravel	10,370	Ms-287	IM-33
Weber Sand & Gravel, Inc. R.D. 1 Edgerton, OH 43517 419-298-2592	Weber Sand & Gravel, Inc.	Williams	sand & gravel	145,120	Ws-11	IM-509, IM-661
Weidle Sand & Gravel, Inc. P.O. Box 247 Germantown, OH 45327 513-855-4501	Weidle Sand & Gravel, Inc.	Montgomery	sand & gravel	165,035	My-41	IM-360
Welch Sand & Gravel, Inc. 10217 Columbia St. Harrison, OH 45030-9751 513-353-3220	Schlichter Pit and Mill-Five Fernald Pit-Seven East Miami Pit & Mill-Two Hooven Pit-Three	Butler Hamilton Hamilton Hamilton	sand & gravel sand & gravel sand & gravel sand & gravel	77,631 49,272 301,267 100	Br-38 Hmn-42 Hmn-48 Hmn-49	IM-218 IM-823 IM-220 IM-176

**1984 OHIO ALPHABETICAL DIRECTORY OF
INDUSTRIAL-MINERAL MINE OPERATORS REPORTING SALES—Continued**

Name and address of operator	Name of mine	County	Commodity	1984 sales (tons)	State mine number	Division of Reclamation permit number
Wentz Concrete & Supply, Inc. R.D. 3 Newcomerstown, OH 43832 614-498-7788	Wentz Concrete & Supply, Inc.	Coshocton	sand & gravel	27,627	Cn-647	IM-753
White Bros. Sand, Inc. 1845 Collingwood Blvd. Toledo, OH 43695 419-243-2121		Maumee Bay, Maumee River	sand & gravel	147,866		
Whitehall Farms, Inc. P.O. Box 335 Green Springs, OH 44836 419-639-2943	Whitehall Farms	Sandusky	sand & gravel	6,000	Sy-18	
Winzeler Excavating Co. Center St. Bryan, OH 43506 419-636-4285	Winzeler Excavating Co.	Logan	sand & gravel	111,090	Lgn-38	IM-881
John Wise Gravel Co. 8535 W. Klinger Rd. Covington, OH 45318 513-473-3246	Wise Gravel	Miami	sand & gravel	6,325	Mi-9	IM-408
Woodville Concrete Corp. 7131 W. Fenner Rd. Ludlow Falls, OH 45339 513-698-4156	Woodville Concrete Corp.	Miami	sand & gravel	344	Mi-4	IM-472
Wright Sand 3632 South State Rte. 231 Tiffin, OH 44883 419-447-5346	Wright Sand Pit	Seneca	sand & gravel	3,220	Sa-11	IM-561
Wyandot Dolomite, Inc. P.O. Box 126 Carey, OH 43316 419-396-7641	Wyandot Dolomite, Inc.	Wyandot	limestone	705,433	Wt-8	IM-273
Wysong Gravel Co. 5897 State Rte. 503 N Lewisburg, OH 45338 513-962-2559	Camden Plant West Alexandria Plant	Preble Preble	sand & gravel sand & gravel	70,120 88,033	Pre-4 Pre-6	IM-477 IM-478
Wysong Stone Co. 5040 Wolfe Creek Pike Dayton, OH 45426 513-962-2559	Wysong Stone Co.	Preble	limestone	37,269	Pre-5	IM-447
X L Sand & Gravel P.O. Box 157 Negley, OH 44441 216-426-9876	X L Sand & Gravel	Columbiana	sand & gravel	41,350	Ca-881	IM-610
Xenia Sand, Gravel, & Asphalt Paving Co. Dayton-Xenia Rd. P.O. Box 10 Xenia, OH 45385 513-372-2736	Xenia Sand, Gravel, & Asphalt Paving Co.	Greene	sand & gravel	7,784	Ge-10	IM-518
York Road Gravel Co. 8819 York Rd. SW Pataskala, OH 43062 614-927-2821	York Road Gravel Co.	Licking	sand & gravel	5,000	Lg-38	IM-695
Young's Sand & Gravel Co. 689 State Rte. 39 W Box 117 Loudonville, OH 44842 419-994-3040	Young's Sand & Gravel Co.	Ashland	sand & gravel	182,592	Ald-7	IM-392
Zerger's Quarry 100 N. Sycamore St. Woodsfield, OH 43793 614-472-1675	Zerger's Quarry	Monroe, Noble	limestone	18,500	Ne-86	IM-70
Zoar Mining Co. P.O. Box 550 Zoar, OH 44697 216-223-1511	Zoar Mining Co. Zoar Mining Co.	Tuscarawas Tuscarawas	shale clay	5,774 38,041	Ts-538 Ts-540	IM-27 IM-28
Zollinger Sand & Gravel Co. 11899 Easton Rd. Rittman, OH 44270 216-855-2464	Zollinger Sand & Gravel Co.	Wayne	sand & gravel	145,285	We-15	IM-398

1984 OHIO DIRECTORY OF REPORTING LIMESTONE-MINE OPERATORS, BY COUNTY

County	Name of operator	Name of mine or quarry	Township	Geological unit	Type and principal use	State mine number
Adams	Davon, Inc.	Plum Run Stone Div.	Meigs	Peebles, Greenfield, & Tymochee Dolomites (Silurian)	crushed stone—riprap, metallurgical stone, stone for portland cement concrete, building, road base, resurfacing stone, other; aglime	Ads-1
	Standard Slag Co.	Adams	Franklin	Silurian	crushed stone—riprap, stone for portland cement concrete, building, road base, resurfacing stone	Ads-6
Allen	Bluffton Stone Co.	Bluffton Stone Co.	Richland	Tymochee Dolomite (Silurian)	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, farm; aglime	An-1
	National Lime & Stone Co.	Lima Plants	Bath	Silurian	crushed stone—riprap, building, road base, resurfacing stone, railroad ballast, flux	An-3
	Suever Stone Co., Inc.	Suever Stone Co., Inc.	Spencer	Tymochee Dolomite (Silurian)	crushed stone—stone for bituminous concrete, building, road base, resurfacing stone; aglime	An-4
Athens	Diamond Stone Quarries, Inc.	Plant No. 1	Lee	Brush Creek limestone (Pennsylvanian)	crushed stone—building, road base, resurfacing stone	As-532
		Plant No. 2	Lee	Brush Creek limestone (Pennsylvanian)	crushed stone—building, road base, resurfacing stone	As-533
Auglaize	Con-Ag, Inc.	Con-Ag, Inc.	Noble	Cedarville Dolomite (Silurian)	crushed stone—riprap, building, road base, resurfacing stone	Ae-31
	National Lime & Stone Co.	Buckland Plant	Moulton	Silurian	crushed stone—riprap, building, road base, resurfacing stone, railroad ballast; aglime	Ae-10
Belmont	Ayers Limestone Quarry, Inc.	Ayers Limestone Quarry	Pease	Permian	crushed stone—riprap, building, road base, resurfacing stone	Bt-716
	Cravat Coal Co.	Dover Pit	York	Fishpot limestone (Pennsylvanian)	crushed stone—building, road base, resurfacing stone	Bt-119
Brown	Brown County Highway Dept.	Brown County Rock Crusher	Lewis	Ordovician	crushed stone—building, road base, resurfacing stone	Bn-1
Carroll	Puskarich Limestone Co.	Puskarich Limestone Co.	Lee	Pennsylvanian	crushed stone—building, road base, resurfacing stone	Cl-183
Clark	American Aggregates Corp.	Springfield #223	Springfield	Cedarville Dolomite (Silurian)	crushed stone—building, road base, resurfacing stone	Ck-1
Clinton	Melvin Stone Co.	Melvin Stone Co.	Richland	Guelph Dolomite (Silurian)	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone; aglime	Cln-1
Crawford	National Lime & Stone Co.	Bucyrus Plant	Holmes	Devonian	crushed stone—riprap, building, road base, resurfacing stone, railroad ballast, flux	Cd-1
Darke	American Aggregates Corp.	Fort Jefferson #424	Neave	Cedarville Dolomite (Silurian)	crushed stone—building, road base, resurfacing stone	Dke-1
Delaware	American Aggregates Corp.	Shawnee #225	Concord	Columbus & Delaware Limestones (Devonian)	crushed stone—building, road base, resurfacing stone	Del-4
	National Lime & Stone Co.	Delaware Plant	Scioto	Columbus & Delaware Limestones (Devonian)	crushed stone—riprap, building, road base, resurfacing stone, railroad ballast, flux	Del-5
	Owens Stone Co., Inc.	Owens Stone Co.	Scioto	Columbus Limestone (Devonian)	crushed stone—building, road base, resurfacing stone	Del-3
	Penry Stone Co.	Penry Stone Co.	Radnor	Columbus Limestone (Devonian)	crushed stone—building, road base, resurfacing stone	Del-2
Erie	Erie Blacktop, Inc.	Erie Blacktop, Inc.	Margaretta		crushed stone—riprap	Ee-27

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County	Name of operator	Name of mine or quarry	Township	Geological unit	Type and principal use	State mine number
Erie (cont.)	Sandusky Crushed Stone Co., Inc.	Sandusky Crushed Stone Co., Inc.	Groton	Columbus & Delaware Limestones (Devonian)	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, railroad ballast, other; aglime	Ee-11
	Wagner Quarries Co.	Soldiers Home Quarry	Perkins	upper Columbus & Delaware Limestones (Devonian)	crushed stone—building, road base, resurfacing stone	Ee-1
	American Aggregates Corp.	Blue Rock Limestone #222	Perry	Tymochtee Dolomite (Silurian)	crushed stone—building, road base, resurfacing stone	Fe-2
Fayette	Sugar Creek Stone Quarry, Inc.	Sugar Creek Stone Quarry, Inc.	Perry, Union	Greenfield Dolomite (Silurian)	crushed stone—building, road base, resurfacing stone	Fe-3
	American Aggregates Corp.	Marble Cliff #224	Norwich	Columbus & Delaware Limestones (Devonian)	crushed stone—building, road base, resurfacing stone	Fn-2
		Columbus Limestone #221	Marion	Columbus Limestone (Devonian)	crushed stone—building, road base, resurfacing stone	Fn-53
Greene	American Aggregates Corp.	Cedarville Limestone #423	Cedarville	Cedarville Dolomite (Silurian)	crushed stone—building, road base, resurfacing stone	Ge-17
	Southwestern Portland Cement Co.	Southwestern Portland Cement Co.	Bath	upper Brassfield Limestone (Silurian)	stone for portland cement manufacture	Ge-1
	National Lime & Stone Co.	Findlay Plant	Liberty	Silurian	crushed stone—riprap, building, road base, resurfacing stone, railroad ballast	Hk-1
Hancock	Pifer Stone Co.	Pifer Stone Co.	Madison	Tymochtee Dolomite (Silurian)	crushed stone—building, road base, resurfacing stone	Hk-4
	Tarbox-McCall Stone Co.	Tarbox-McCall Stone Co.	Liberty	Greenfield Dolomite (Silurian)	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, railroad ballast	Hk-2
	Hardin Quarry Co., Inc.	Hardin Quarry Co., Inc.	Pleasant	Tymochtee Dolomite (Silurian)	crushed stone—riprap, building, road base, resurfacing stone; aglime	Hdn-2
Hardin	Standard Slag Co.	Forest	Jackson	Silurian	crushed stone—stone for portland cement manufacture, building, road base, resurfacing stone	Hdn-1
	Davon, Inc.	Highland Stone Div.	Hamer	Brassfield & Dayton Limestones (Silurian)	crushed stone—riprap, metallurgical stone, stone for portland cement concrete, building, road base, resurfacing stone; aglime	Hd-2
	Ohio Asphaltic Limestone Corp.	Ohio Asphaltic Limestone Corp.	Union		crushed stone—riprap, stone for bituminous concrete, building, road base, resurfacing stone; aglime	Hd-3
Highland	Marshall Quarry, Inc.	Marshall Quarry, Inc.	Marshall		crushed stone—building, road base, resurfacing stone	Hd-4
	Holmes Limestone Co.	Holmes 241 Plant	Hardy	Putnam Hill limestone (Pennsylvanian)	crushed stone—building, road base, resurfacing stone	Hs-67
	D & J Energy, Inc.	Wayne Mine	Prairie	Putnam Hill limestone (Pennsylvanian)	crushed stone—building, road base, resurfacing stone	Hs-79
Jackson	Waterloo Coal Co., Inc.	D & J Energy Zoar	Bloomfield, Madison	Vanport limestone (Pennsylvanian)	crushed stone—unspecified	Jkn-583
	Brohard Mining & Development, Inc.	Brohard Mining & Development, Inc.	Elizabeth		crushed stone—building, road base, resurfacing stone	Jkn-367
	Connelly Construction Co., Inc.	East Liberty Quarry	Perry		crushed stone—building, road base, resurfacing stone	Le-BMD ¹
Lawrence	C. E. Duff & Son, Inc.	C. E. Duff & Son, Inc.	Richland	Tymochtee Dolomite (Silurian)	crushed stone—unspecified	Lgn-1
Logan	Northwood Stone & Asphalt Co.	Northwood Stone & Asphalt Co.	Richland		crushed stone—riprap, stone for portland cement concrete, building, road base, resurfacing stone	Lgn-15
					crushed stone—riprap, stone for bituminous concrete, building, road base, resurfacing stone	Lgn-2
	The France Stone Co.	Waterville Silica	Waterville	Tymochtee Dolomite (Silurian)	crushed stone—riprap, building, road base, resurfacing stone	Ln-1
Lucas			Sylvania	Detroit River Group (Devonian)	crushed stone—riprap, building, road base, resurfacing stone	Ln-3

	Maumee Stone Co.	Maumee Stone Co.	Waynesfield		crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, ice control	Ls-2
Mahoning	Heiser Stone Co.	Heiser Stone Co.	Smith		crushed stone—building, road base, resurfacing stone	Mg-43
	Honey Creek Stone Co.	Honey Creek Stone Co.	Springfield		crushed stone—building, road base, resurfacing stone	Mg-54
	SME Bessemer, Inc.	Quarry #8	Poland		dimension stone; stone for portland cement manufacture; aglime	Mg-608
	J. M. Hamilton & Sons Co.	J. M. Hamilton & Sons Co.	Marion		crushed stone—stone for bituminous concrete, building, road base, resurfacing stone	Mn-2
Marion	National Lime & Stone Co.	Marion Plant	Marion		crushed stone—riprap, building, road base, resurfacing stone, railroad ballast, flux stone; aglime	Mn-3
	Tri-County Limestone Co.	Tri-County Limestone Co.	Grand		crushed stone—riprap, stone for portland cement concrete, building, road base, resurfacing stone, other; aglime	Mn-1
Mercer	John W. Karch Stone Co.	John W. Karch Stone Co.	Jefferson		crushed stone—riprap, stone for portland cement concrete, building, road base, resurfacing stone; aglime	Mr-1
	Rockford Stone Co.	Rockford Stone Co.	Dublin		crushed stone—building, road base, resurfacing stone; aglime	Mr-2
Miami	Armco, Inc.	Piqua Minerals	Spring Creek		crushed stone—riprap, metallurgical stone, building, road base, resurfacing stone, railroad ballast, fillers; aglime	Mi-1
	Gregory Stone, Inc.	Gregory Quarry	Union		dimension stone	Mi-16
	Ludlow Stone, Inc.	Ludlow Stone, Inc.	Union		crushed stone—riprap, building, road base, resurfacing stone; aglime	Mi-502
	C. F. Poeppelman Sand & Stone, Inc.	C. F. Poeppelman, Inc.	Newberry		crushed stone—riprap, stone for portland cement concrete, building, road base, resurfacing stone; aglime	Mi-10
Monroe	Gerald L. Christman	Christman Quarry	Seneca		crushed stone—building, road base, resurfacing stone, other	Me-501
	Zerger's Quarry	Zerger's Quarry	Franklin		crushed stone—building, road base, resurfacing stone	Ne-86 ²
Montgomery	American Aggregates Corp.	Phillipsburg Limestone #421	Clay		crushed stone—building, road base, resurfacing stone	My-1
	Southwestern Portland Cement Co.	Dayton Limestone #420	Madison		crushed stone—building, road base, resurfacing stone	My-23
	Sidwell Bros., Inc.	Southwestern Portland Cement Co.	Wayne		dimension stone	My-58
	Chesterhill Stone Co.	Sidwell Quarry #3	Manchester		crushed stone—building, road base, resurfacing stone	Mon-600
Muskingum	Columbia Portland Cement Corp.	Fultonham Plant #1	Newton		crushed stone—riprap, metallurgical stone, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone; aglime	Mum-106
	Sidwell Bros., Inc.	Lyle Quarry	Newton		stone for portland cement manufacture	Mum-24
	King Quarries, Inc.	Sidwell Quarry	Newton		crushed stone—stone for bituminous concrete, building, road base, resurfacing stone	Mum-104
	Zerger's Quarry	Sidwell Quarry #2	Meigs, Rich Hill		crushed stone—building, road base, resurfacing stone	Mum-896
Noble	Edward Kraemer & Sons, Inc.	King Quarries, Inc.	Brookfield		crushed stone—building, road base, resurfacing stone	Ne-106
		Zerger's Quarry	Stock		crushed stone—building, road base, resurfacing stone	Ne-86 ³
Ottawa		White Rock Quarry	Allen		crushed stone—riprap, metallurgical stone, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone; stone for portland cement manufacture; aglime	Oa-6

¹No mine number has been assigned by the Division of Mines.

²See also Noble County.

³See also Monroe County.

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County	Name of operator	Name of mine or quarry	Township	Geological unit	Type and principal use	State mine number
Ottawa (cont)	Maumee Stone Co.	Rocky Ridge	Benton		crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, other	Oa-14
	Standard Slag Co.	Marblehead	Danbury	Columbus Limestone (Devonian)	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone	Oa-7
	USG Industries, Inc.	USG Industries, Inc.	Clay	Silurian	crushed stone—building, road base, resurfacing stone; lime (burned stone)—building, chemical and industrial	Oa-1
Paulding	The France Stone Co.	Paulding	Crane	Tennile Creek Dolomite (Devonian)	crushed stone—riprap, building, road base, resurfacing stone; aglime	Pg-7
	General Portland, Inc.	Paulding Quarry	Crane	Detroit River Group & Dundee Limestone (Devonian)	crushed stone—building, road base, resurfacing stone; stone for portland cement manufacture	Pg-1
	Maumee Stone Co.	Auglaize	Auglaize	Detroit River Group & Dundee Limestone (Devonian)	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, ice control; aglime	Pg-2
Perry	Maxville Stone Co.	Maxville Stone Co.	Monday Creek	Maxville Limestone (Mississippian)	crushed stone—building, road base, resurfacing stone	Py-235
Pike	Latham Limestone, Inc.	Rogers Quarry	Mifflin	Greenfield Dolomite (Silurian)	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, railroad ballast, other; aglime	Pke-13
Preble	Wysong Stone Co.	Wysong Stone Co.	Twin		crushed stone—riprap, building, road base, resurfacing stone; dimension stone	Pre-5
Putnam	Ottawa Stone Co., Inc. Putnam Stone Co., Inc.	Ottawa Stone Co. Putnam Stone Co.	Blanchard Pleasant, Riley	Tymochtee Dolomite (Silurian) Silurian	unspecified crushed stone—riprap, building, road base, resurfacing stone	Pm-3 Pm-2
Sandusky	The France Stone Co.	Bellevue	City of Bellevue		crushed stone—building, road base, resurfacing stone	Sy-6
	Gottron Bros. Co.	Gottron Bros. Co.	Sandusky	Silurian	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, other	Sy-5
	Martin Marietta Chemicals	Woodville Quarry	Woodville	Guelph Dolomite (Silurian)	crushed stone—riprap, flux stone, lime (burned stone)—chemical and industrial, refractory	Sy-1
Seneca	Ohio Lime Co.	Plant #3	Jackson	Guelph Dolomite (Silurian)	crushed stone—berm stone, other; aglime; lime (burned stone)—chemical and industrial	Sy-4
	Steelley Resources, Inc.	Ohio Lime Co.	Woodville	Silurian	crushed stone—metallurgical stone, building, road base, resurfacing stone; aglime; lime (burned stone)—chemical and industrial, other	Sy-8
	The France Stone Co.	Bloomville	Bloom	Columbus & Delaware Limestones (Devonian)	crushed stone—riprap, building, road base, resurfacing stone; dimension stone; aglime	Sa-3
Shelby	Lintner & Luft, Inc.	Flat Rock	Thompson		crushed stone—riprap, building, road base, resurfacing stone; dimension stone; aglime	Sa-1
	Miami River Stone Co.	Lintner & Luft, Inc. Quarry	Thompson	Cedarville Dolomite (Silurian)	crushed stone—riprap, building, road base, resurfacing stone; dimension stone	Sa-8
	Sidney Sand & Gravel Co. Spring Creek Corp.	Rock Run Quarry Quarry Deposit	Washington Clinton		crushed stone—riprap, stone for bituminous concrete, building, road base, resurfacing stone, railroad ballast; aglime crushed stone—riprap crushed stone—building, road base, resurfacing stone	Shy-17 Shy-16 Shy-15

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Name of operator	Permitted dredging areas
Erie Sand & Steamship Co.	Fairport, Vermilion Lorain Inner, Vermilion Lorain Outer
Osborne Materials Co.	Fairport, Vermilion-Lorain Inner, Vermilion-Lorain Outer
White Bros. Sand, Inc.	Maumee Bay, Maumee River

*Sales only of limestone — no mining. All material shipped in for sale.

Stark	East Ohio Limestone Co.	Lake	Putnam Hill limestone (Pennsylvania)	crushed stone—building, road base, resurfacing stone	Sk 663
Tuscarawas	Black Hawk Mine	Bethlehem, Pike	Putnam Hill & Vanport limestones (Pennsylvania)	crushed stone—riprap, building, road base, resurfacing stone	Sk 217
	#3 Pit	Marlboro	Putnam Hill limestone (Pennsylvania)	unspecified	Sk 222
	Finzer-Belden Pit	Sugar Creek	Putnam Hill limestone (Pennsylvania)	crushed stone—building, road base, resurfacing stone	Ts 1646
	Sugarcreek Clay & Limestone, Inc.	Sugar Creek		crushed stone—riprap, building, road base, resurfacing stone; dimension stone	Ts 1928
Union	L. G. Rockhold & Sons, Inc.	York		crushed stone—stone for portland cement concrete, building, road base, resurfacing stone; aglime	Un-1
	Union Limestone Plant	Millcreek	Columbus Limestone (Devonian)	crushed stone—riprap, building, road base resurfacing stone; aglime	Un-2
Van Wert	Delphos Quarries Co.	Washington	Tymochtee Dolomite (Silurian)	crushed stone—riprap, stone for portland cement concrete, building, road base, resurfacing stone; aglime	Vt 1
	Maumee Stone Co.	Union		crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, ice control	Vt 3
Warren	Ridge Township Quarry	Ridge	Tymochtee Dolomite (Silurian)	unspecified	Vt 7
	American Aggregates Corp.	Wayne	Brassfield Limestone (Silurian)	crushed stone—building, road base, resurfacing stone	Wan 35
Washington	Guernsey Limestone Co.	Adams	Benwood & Uniontown limestones (Pennsylvania)	crushed stone—building, road base, resurfacing stone	Wa 47
	Maumee Stone Co.	Superior		crushed stone—stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, other; aglime	Ws 64
Wood	The France Stone Co.	Milton		crushed stone—riprap, building, road base, resurfacing stone; aglime	Wd 5
	MacRitchie Materials, Inc.	Perry	Silurian	crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, railroad ballast, dimension stone	Wd 1
Wyandot	Maumee Stone Co.	Perrysburg		crushed stone—riprap, stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, ice control; aglime	Wd 6
	Portage	Portage	Greenfield & Lockport Dolomites (Silurian)	crushed stone—unspecified	Wd 11
	Charles H. McCarthy Quarry	Pitt	Bass Islands Group (Silurian)	crushed stone—building, road base, resurfacing stone	Wt 3
	National Lime & Stone Co.	Crawford	Silurian	crushed stone—riprap, building, road base, resurfacing stone, railroad ballast, flux stone; aglime; lime (burned stone)—chemical and industrial	Wt 1
	Wyandot Dolomite, Inc.	Crawford	Greenfield & Guelph Dolomites (Silurian)	crushed stone—stone for portland cement concrete, stone for bituminous concrete, building, road base, resurfacing stone, railroad ballast, refractory stone, manufactured sand; aglime	Wt 8

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County	Name and address of operator	Name of pit	Township	Type and principal use	State mine number
Allen	Rockport Sand & Gravel Co., Inc.	Pit #1	Monroe	sand—portland cement concrete, building, road construction, resurfacing gravel—building, filtration sand—road construction, resurfacing, other gravel—building, other	An-14
		Pit #2	Monroe		An-15
Ashland	Charles Bucklew Sand & Gravel Co. Alvin Kelfer Trucking & Excavating	Charles Bucklew Dinsmore Pit	Jackson Jackson	sand—fill sand—road construction, resurfacing gravel—road construction, resurfacing	Ald-3 Ald-12
	Ries Sand & Gravel	Ries Sand & Gravel	Mohican	sand—building, road construction, resurfacing gravel—building, road construction, resurfacing	Ald-9
	Simanton Sand Co.	Simanton Sand Co.	Montgomery	sand—portland cement concrete, building gravel—driveway use	Ald-11
	Young's Sand & Gravel Co.	Young's Sand & Gravel Co.	Green	sand—building, road construction, resurfacing, other gravel—building, road construction, resurfacing, other	Ald-7
Ashtabula	Janson Soil Services Kinsman Sand & Gravel Co.	Janson Soil Services Kinsman Sand & Gravel Co.	Morgan Wayne	gravel—driveway use sand—portland cement concrete, building, road construction, resurfacing, fill	Asa-14 TI-91
	Nelson Sand & Gravel, Inc.	Nelson Sand & Gravel, Inc.	Kingsville	gravel—building, road construction, resurfacing, fill sand—building, fill	Asa-11
	R. W. Sidley, Inc.	Conneaut Plant	Kingsville	gravel—building, fill sand—building	Asa-15
	Skidmore & Chah, Inc.	Amboy Pit	Monroe	gravel—building, filtration sand—fill gravel—fill	Asa-13
Athens	Athens Building Materials Co., Inc.	Kimberly Pit	York	sand—building gravel—building	As-1117
	Lake Hope Asphalt, Inc.	Lake Hope Asphalt, Inc.	York	sand—bituminous concrete, fill gravel—bituminous concrete, fill	As-1161
Auglaize	Joseph Sand & Gravel National Lime & Stone Co.	Joseph Sand & Gravel Wapak Sand & Gravel	Union Union	gravel—fill sand—portland cement concrete, building gravel—portland cement concrete, road construction, resurfacing	Ae-23 Ae-30
	Quality Ready Mix, Inc.	Quality Pit	Pusheta	sand—portland cement concrete gravel—building	Ae-16
Belmont	Tri-State Asphalt Products	Tri-State Asphalt Products	Mead	sand—portland cement concrete, bituminous concrete gravel—portland cement concrete, bituminous concrete, road construction, resurfacing	Bt-74
Butler	Aggregate Services, Inc. American Materials Corp.	Aggregate Services, Inc. Hamilton #710 Fairfield #711	St. Clair St. Clair Fairfield	sand—other gravel—building, road construction, resurfacing sand—road construction, resurfacing gravel—road construction, resurfacing sand—road construction, resurfacing gravel—road construction, resurfacing gravel—other	Br-36 Br-5 Br-35
	Broshear Gravel Co. Dravo Corp.	Broshear Contractors, Inc. Fairfield Plant	Ross Fairfield	sand—road construction, resurfacing gravel—road construction, resurfacing	Br-48 Br-14
	Indian Creek Gravel Co. Martin Farms, Inc.	Ross Plant Indian Creek Sand & Gravel Martin Farms, Inc.	Ross Ross Madison	gravel—road construction, resurfacing gravel—building, road construction, resurfacing, fill, other sand—road construction, resurfacing gravel—road construction, resurfacing	Br-29 Br-40 Br-52
	Mecco, Inc.	Mecco, Inc.	Lemon	gravel—road construction, resurfacing sand—portland cement concrete, building gravel—building, portland cement concrete	Br-15
	Middletown Sand & Gravel Co.	Middletown Sand & Gravel Co.	Lemon	gravel—building, road construction, resurfacing sand—building, road construction, resurfacing	Br-1
	Moorman Sand & Gravel Co.	Moorman Sand & Gravel Co.	Madison	gravel—building, road construction, resurfacing, fill sand—building, road construction, resurfacing, fill	Br-6
	New Miami Sand & Gravel	New Miami Sand & Gravel	St. Clair	gravel—building, road construction, resurfacing gravel—building, road construction, resurfacing	Br-3

	Watson Gravel, Inc.		Watson Pit	Fairfield	sand—portland cement concrete, bituminous concrete, building, fill gravel—building, portland cement concrete, road construction, resurfacing sand—building gravel—building	Br-47
	Welch Sand & Gravel, Inc.		Schlichter Pit and Mill Five	Fairfield	sand—road construction, resurfacing gravel—road construction, resurfacing	Br-38
Carroll	Oneida Sand & Gravel, Inc.		Oneida Sand & Gravel, Inc.	Brown	sand—road construction, resurfacing gravel—road construction, resurfacing	Cl-204
Champaign	American Aggregates Corp.		Urbana #215	Urbana	sand—road construction, resurfacing gravel—road construction, resurfacing	Opn-1
	D & W Sand & Gravel Co.		D & W Sand & Gravel	Union	sand—fill gravel—fill	Opn-21
	Mechanicsburg Sand & Gravel, Inc.		Mechanicsburg Sand & Gravel, Inc.	Union	sand—unspecified gravel—unspecified	Opn-22
	Moore's Excavating Co.		Moore's Excavating Co.	Salem	sand—building gravel—building	Opn-20
Clark	American Aggregates Corp.		Fairborn #413	Bethel	sand—road construction, resurfacing gravel—road construction, resurfacing	Ck-13
	County Line Sand & Gravel Woodrow C. Demmy		County Line Sand & Gravel Demmy Sand & Gravel	Moorefield Mad River	gravel—building sand—building gravel—fill	Ck-27 Ck-502
	Dinnen Sand & Gravel Hilltop Basic Resources, Inc.		Dinnen Sand & Gravel Enon Washed Sand & Gravel Co.	Mad River Bethel	sand—foundry sand—building, portland cement concrete, bituminous concrete, road construction, resurfacing	Ck-501 Ck-3
	Springfield Sand & Gravel Co.		Fairborn Aggregate Plant Springfield Sand & Gravel Co.	Bethel Springfield	gravel—building, portland cement concrete, bituminous concrete, road construction, resurfacing, other sand—portland cement concrete, bituminous concrete, other gravel—portland cement concrete, bituminous concrete, other sand—portland cement concrete, bituminous concrete, road construction, resurfacing	Ge-4 ² Ck-25
Clermont	Kipp's Gravel Co., Inc.		Kipp's Gravel Co., Inc.	Stonelick	gravel—unspecified sand—unspecified	Ct-7
Columbiana	Beaver Creek Sand & Gravel, Inc.		Beaver Creek Sand & Gravel, Inc.	Salem	sand—building, road construction, fill gravel—building	Ca-855
	Neiheisel Sand & Gravel		Leetonia Pit & Mill	Fairfield	sand—building gravel—building	Ca-600
	XL Sand & Gravel		XL Sand & Gravel	Middleton	sand—portland cement concrete, road construction, resurfacing gravel—building, portland cement concrete, road construction, resurfacing, filtration	Ca-881
Coshocton	Apache Aggregate & Paving Co.		Apache Aggregate & Paving Co.	Keene	sand—road construction, resurfacing gravel—road construction, resurfacing	Cn-783
	Boyd Gravel Co.		Boyd Gravel Co.	Bethlehem	sand—building, road construction, resurfacing gravel—building, road construction, resurfacing	Cn-694
	Spring Industries		Newcomertown Plant	Oxford	sand—bituminous concrete gravel—bituminous concrete	Cn-624
	Wentz Concrete & Supply, Inc.		Wentz Concrete & Supply, Inc.	Oxford	sand—unspecified gravel—unspecified	Cn-647
Crawford	Gibson Sand & Gravel Co.		Gibson Sand & Gravel	Jefferson	sand—fill gravel—fill	Cd-3
Cuyahoga	Silver Arrow Systems, Inc. Terra Vista Sand & Gravel		Silver Arrow Systems, Inc. Terra Vista Sand & Gravel	Glenwillow Subdivision City of Valley View	sand—fill sand—fill gravel—fill	Cya-26 Cya-31
Darke	Fourman's Sand & Gravel, Inc.		Fourman's Sand & Gravel, Inc.	Greenville	sand—portland cement concrete, building, other gravel—building, portland cement concrete, other	Dke-4
	Hollinger Gravel Plant		Hollinger Gravel Plant	Harrison	sand—farm use gravel—building, road construction, resurfacing, other	Dke-10
Defiance	Hillsdale Sand & Gravel, Inc.		Hillsdale Sand & Gravel, Inc.	Farmer	gravel—road construction, resurfacing	De-2
Erie	Keener Sand & Clay Co. Mesenburg Bros., Inc. Miller Sand Co. Ohio Foundry Sand Co.		Huron Plant Mesenburg Bros., Inc. Miller Sand Co. Shinrock Plant	Huron Margaretta Berlin	sand—foundry sand—unspecified sand—fill sand—foundry	Ee-5 Ee-24 Ee-28 Ee-13

¹See also Trumbull County.
²See also Greene County.

1984 OHIO DIRECTORY OF REPORTING SAND AND GRAVEL MINING OPERATORS, BY COUNTY—Continued

County	Name and address of operator	Name of pit	Township	Type and principal use	State mine number
Fairfield	C. D. Materials	Plant #1	Berne	sand—road construction, resurfacing	Fd-1
	Davis Sand & Gravel	Alley Pit	Berne	gravel—road construction, resurfacing	Fd-CD ¹
			Hocking	sand—road construction, resurfacing	Fd-12
Franklin				sand—unspecified	
				gravel—unspecified	
	American Aggregates Corp.	Columbus #210	Marion	sand—road construction, resurfacing	Fn-6
		Loekbourne #213	Hamilton	gravel—road construction, resurfacing	Fn-23
	Big Walnut Sand & Gravel Co.		Hamilton, Madison	sand—road construction, resurfacing	Fn-14
	J P Sand & Gravel Co.	J P Sand & Gravel Co.	Hamilton	gravel—road construction, resurfacing	Fn-52
	L & M Excavators	Westerville Industrial Park	Blendon	gravel—building, fill	Fn-54
	Masons Sand & Gravel Co.	Masons Sand & Gravel	Hamilton	gravel—building	
	Muskingum River Gravel Co.	Plant #6	Hamilton	gravel—building	
			Hamilton	sand—building	
Gallia				sand—portland cement concrete, bituminous concrete, building, filtration	Fn-24
				gravel—building, portland cement concrete, filtration	
	Olen Corp.	Olen Corp.	Brown	sand—building, road construction, resurfacing	Fn-43
	Wapak Sand & Gravel Co.	Agg Rok	Franklin	gravel—building, road construction, resurfacing	Fn-36
				sand—portland cement concrete, bituminous concrete, building	
				gravel—portland cement concrete, bituminous concrete	
	M. T. Epling Co.	M. T. Epling Sand & Gravel Plant	Gallipolis	sand—unspecified	Ga-245
	Gallia Aggregates & Construction	Gallia Aggregates & Construction	Ohio	gravel—unspecified	Ga-244
	Keener Sand & Clay Co.	Gallia Plant	Springfield	sand—bituminous concrete	Ga-507
	American Aggregates Corp.	Xenia #414	Beaver Creek	sand—foundry	
Greene	Hilltop Basic Resources, Inc.	Fairborn Aggregate Plant	Bath	sand—road construction, resurfacing	Ge-33
				gravel—road construction, resurfacing	Ge-4 ⁴
				sand—portland cement concrete, bituminous concrete, building	
				gravel—building, portland cement concrete, bituminous concrete, other	
	Phillips Sand & Gravel	Phillips Sand & Gravel	Beaver Creek	sand—portland cement concrete, building, road construction, resurfacing, other	Ge-36
Hamilton				gravel—building, portland cement concrete, road construction, resurfacing, filtration, other	
	Xenia Sand, Gravel, & Asphalt Paving Co.	Xenia Sand, Gravel, & Asphalt Paving Co.	Xenia	sand—building, road construction, resurfacing, other	Ge-10
				gravel—building, bituminous concrete, road construction, resurfacing, filtration	
	American Materials Corp.	Harrison #712	Harrison	sand—road construction, resurfacing	Hmn-37
		Kilby Rd. #713	Whitewater	gravel—road construction, resurfacing	Hmn-AMC ³
	Ashcraft Sand & Gravel	Ashcraft Sand & Gravel	Whitewater	sand—road construction, resurfacing	Hmn-54
	Barrett Paving Materials, Inc.	Barrett Paving Materials, Inc.	Crosby	gravel—building	Hmn-44
	James Bunnell, Inc.	James Bunnell, Inc.	Whitewater	sand—road construction, resurfacing, other	Hmn-59
				gravel—road construction, resurfacing, fill, other	
	Dravo Corp.	Cleves Plant	Miami	sand—unspecified	Hmn-3
Hamilton				gravel—road construction, resurfacing	
		Camp Dennison Plant	Symmes	sand—road construction, resurfacing	Hmn-5
		Newtown Plant	Anderson	gravel—road construction, resurfacing	Hmn-11
		Cleves Plant	Whitewater	sand—road construction, resurfacing	Hmn-64
	Eaton Sand & Gravel Co., Inc.	Eaton Sand & Gravel Co., Inc.	Miami	gravel—road construction, resurfacing	Hmn-46
				sand—bituminous concrete, unspecified	
				gravel—bituminous concrete, road construction, resurfacing, unspecified	
	Hornsby Sand & Gravel Co.	Hornsby Sand & Gravel Co.	Whitewater	sand—road construction, resurfacing	Hmn-45
				gravel—building	

Queen City Gravel Co. George L. Rack, Inc. T & J Sand & Gravel, Inc.	Queen City Gravel Co. George L. Rack, Inc. T & J Sand & Gravel, Inc.	Miami Mill Creek Whitewater	gravel—road construction, resurfacing, fill sand—mortar sand—road construction, resurfacing gravel—building gravel—unspecified sand—portland cement concrete, bituminous concrete, building, other gravel—building, portland cement concrete, road construction, resurfacing gravel—building sand—building gravel—building sand—building gravel—building	Hmn-16 Hmn-10 Hmn-58 Hmn-28 Hmn-60
Three Rivers Sand & Gravel, Inc. Watson Gravel, Inc.	Three Rivers Sand & Gravel, Inc. Harrison Pit	Miami Whitewater		
Welch Sand & Gravel, Inc.	Fernald Pit-Seven East Miami Pit & Mill-Two Hooven Pit-Three	Crosby Colerain Whitewater		Hmn-42 Hmn-48 Hmn-49
Gerken Materials, Inc.	Gerken Materials, Inc.	Liberty	sand—building, road construction, resurfacing	Hy-5
Hocking County Engineers	Hocking Co. Gravel Pit	Green	sand—road construction, resurfacing	Hg-296
Hocking Valley Concrete	Hocking Valley Concrete	Green	gravel—road construction, resurfacing sand—portland cement concrete, building, road construction, resurfacing, filtration, other gravel—building, portland cement concrete, road construction, resurfacing, filtration, other sand—bituminous concrete, building gravel—building, bituminous concrete	Hg-262 Hg-301
Muskingum River Gravel Co.	Plant #8	Starr	sand—road construction, resurfacing gravel—road construction, resurfacing sand—portland cement concrete, bituminous concrete, building, filtration, other gravel—building, portland cement concrete, bituminous con- crete, road construction, resurfacing, filtration, other	Hs-82 Hs-511
Bros. Sand & Gravel Co.	Bros. Sand & Gravel Co.	Hardy		
Feikert Sand & Gravel, Inc.	Feikert Sand & Gravel, Inc.	Salt Creek		
Montgomery Sand Co. Price Companies, Inc.	Montgomery Sand Co. Price Sand and Gravel Pit #1	New Haven Norwalk	sand—fill sand—portland cement concrete, building, road construction, resurfacing, filtration gravel—building, road construction, resurfacing	Hrn-9 Hrn-1
Fredericktown Sand & Gravel Co.	Fredericktown Sand & Gravel Co.	Middlebury	sand—portland cement concrete, bituminous concrete, building, road construction, resurfacing, unspecified gravel—building, portland cement concrete, bituminous con- crete, road construction, resurfacing, unspecified sand—portland cement concrete, building, road construction, resurfacing, unspecified gravel—building, portland cement concrete, road construction, resurfacing, unspecified	Kx-13 Kx-7
Goodwin Sand & Gravel, Inc.	Goodwin Sand & Gravel, Inc.	Clinton		
Mickley Gravel Co. Purdy Sand & Gravel Co.	Mickley Gravel Co. Purdy Sand & Gravel Co.	Jefferson Clinton	gravel—road construction, resurfacing sand—building, road construction, resurfacing, unspecified gravel—building, road construction, resurfacing, unspecified sand—unspecified gravel—unspecified	Kx-5 Kx-3 Kx-8
Small's Sand & Gravel, Inc.	Small's Sand & Gravel, Inc.	College		
R. W. Sidley, Inc.	Painesville Plant	Painesville	sand—building, unspecified gravel—building, unspecified	Lke 7
Becky Lane Sand Brohard Mining & Development, Inc.	Becky Lane Sand Brohard Mining & Development, Inc.	Perry Elizabeth Perry	sand—fill sand—foundry, refractories sand—foundry, road construction, resurfacing sand—fill, other	Le-430 Le-406 Le-BMD ³ Le-426
Burlington Sand & Gravel Co.	Burlington Sand & Gravel	St. Albans	sand—building gravel—building, road construction, resurfacing sand—road construction, resurfacing gravel—road construction, resurfacing sand—unspecified gravel—unspecified sand—unspecified gravel—unspecified	Lg-8 Lg-2 Lg-7 Lg-31
Alexandria Materials Co.	Alexandria Pit	Newton		
American Aggregates Corp.	Newark #214	Newark		
Dry Creek Crushed Gravel Co.	Dry Creek Crushed Gravel Co.	Newton		
Van Wey Sand & Gravel, Inc.	Dry Creek Farms Van Wey Sand & Gravel, Inc.	Newton, Washington Newton	gravel—unspecified sand—foundry, building gravel—building, bituminous concrete, road construction, resurfacing, ice control gravel—unspecified	Lg-10 Lg-38
York Road Gravel Co.	York Road Gravel Co.	Etna		

³No mine number has been assigned by the Division of Mines.
⁴See also Clark County.

1984 OHIO DIRECTORY OF REPORTING SAND AND GRAVEL MINING OPERATORS, BY COUNTY—Continued

County	Name and address of operator	Name of pit	Township	Type and principal use	State mine number
Logan	C. E. Duff & Son, Inc. Groves Gravel Co. Neer's Engineering Laboratories	Duff Sand C. E. Duff & Son, Inc. Groves Gravel Neer's Engineering Laboratories	Washington Washington Lake Union	sand—portland cement concrete, building gravel—filtration gravel—fill sand—unspecified gravel—unspecified gravel—other	Lgn-31 Lgn-39 Lgn-36 Lgn-6
Lorain	Winzeler Excavating Co.	Winzeler Excavating Co.	Washington		Lgn-38
Lucas	Belu & Son Paving, Inc. Maumee Haulers, Inc. Parker Sand & Stone, Inc.	Belu Sand Pit Nebraska Pit Rte. 295 Pit Angola Road Pit Seaway Sand & Stone	Henrietta Springfield Swanton Springfield Swanton	sand—fill sand—building sand—building sand—building sand—building, road construction, resurfacing	Ln-12 Ls-20 Ls-21 Ls-22 Ls-13
Mahoning	Seaway Sand & Stone, Inc. Neiheisel Sand & Gravel	Seaway Sand & Stone Neiheisel Sand & Gravel	Green	sand—building, unspecified gravel—building, unspecified	Mg-NSG ³
Marion	Penry Stone Co. Rialto Sand & Gravel Union Aggregates Co.	Penry Stone Co. Rialto Sand & Gravel Prospect Sand & Gravel Plant	Prospect Prospect Prospect	sand—building gravel—building gravel—unspecified sand—building gravel—other	Mn-4 Mn-17 Mn-10
Medina	Baker Sand, Inc. Seville Sand & Gravel, Inc.	Baker Sand, Inc. Baker Sand, Inc. Seville Sand & Gravel, Inc.	Harrisville, Westfield Westfield Harrisville	sand—road construction, resurfacing gravel—road construction, resurfacing sand—building, road construction, resurfacing, fill gravel—road construction, resurfacing sand—bituminous concrete, building gravel—building, road construction, resurfacing	Ma-4 Ma-20 Ma-22
Meigs	Dravo Corp. Vivian Humphrey Richards & Son, Inc.	Apple Grove Plant Vivian Humphrey Richards & Son, Inc.	Letart Olive Letart	sand—road construction, resurfacing gravel—road construction, resurfacing gravel—unspecified sand—bituminous concrete, building gravel—building, bituminous concrete, road construction, resurfacing	Ms-205 Ms-295 Ms-298
Miami	Weber Sand & Gravel Ernst Gravel Co. New Carlisle Sand & Gravel Co. Troy Gravel Co. Valley Gravel Co. John Wise Gravel Co. Woodville Concrete Corp.	Weber Sand & Gravel Ernst Gravel Co. New Carlisle Sand & Gravel Co. Troy Gravel Co. Valley Gravel Co. Wise Gravel Woodville Concrete Corp.	Olive Spring Creek Bethel Concord Monroe Newberry Newton	sand—road construction, resurfacing gravel—road construction, resurfacing sand—road construction, resurfacing sand—unspecified gravel—unspecified sand—fill gravel—fill sand—unspecified gravel—unspecified sand—unspecified gravel—unspecified gravel—building, other sand—building gravel—building, unspecified	Ms-287 Mi-6 Mi-501 Mi-3 Mi-8 Mi-9 Mi-4
Montgomery	American Aggregates Corp. Broadway Sand & Gravel, Inc. Carpenter's Excavating Englewood Sand and Gravel Co., Inc. Haas Gravel Co. Hilltop Basic Resources, Inc.	Dayton South #412 Rip Rap Road #416 Broadway Sand & Gravel, Inc. Carpenter's Excavating Englewood Sand and Gravel Englewood Sand and Gravel Haas Gravel Co. West Carrollton Aggregate Plant	City of Moraine Wayne (City of Dayton) City of Moraine City of Moraine Butler Randolph Butler Jefferson, Miami	sand—road construction, resurfacing gravel—road construction, resurfacing sand—road construction, resurfacing gravel—road construction, resurfacing sand—building, other gravel—building sand—fill sand—road construction, resurfacing, unspecified gravel—road construction, resurfacing, unspecified sand—portland cement concrete, road construction, resurfacing gravel—building, portland cement concrete gravel—building sand—portland cement concrete, bituminous concrete, building gravel—portland cement concrete, bituminous concrete, other	My-33 My-66 My-65 My-67 My-64 My-5 My-30 My-19

Morgan	Miller Bros. Gravel, Inc.	Miller Bros. Gravel, Inc.	Butler	sand—portland cement concrete, building, other gravel—building, portland cement concrete, bituminous concrete, road construction, resurfacing, filtration, other	My-52
	Northmont Sand & Gravel Co.	Northmont Sand & Gravel Co.	Randolph	sand—building gravel—other	My-49
	Partin Sand and Gravel Tipp Sand & Gravel Co. Weidle Sand & Gravel, Inc.	Partin Sand and Gravel Tipp Sand & Gravel Co. Weidle Sand & Gravel, Inc.	Wayne Butler German	gravel—building sand—building gravel—building	My-55 My-61 My-41
	Chesterhill Stone Co.	Stockport Plant #2	Windsor	sand—portland cement concrete, bituminous concrete, building, road construction, resurfacing, other gravel—building, portland cement concrete, bituminous concrete, road construction, resurfacing, other	Mon-588
Morrow	Chesterville Sand & Gravel Co., Inc.	Chesterville Sand & Gravel Co., Inc.	Chester	sand—building, road construction, resurfacing gravel—building, road construction, resurfacing, filtration, other	Mw-10
Muskingum	Muskingum River Gravel Co.	Plant #1	Wayne	sand—bituminous concrete, building gravel—building, bituminous concrete	Mum-736
	Salt Creek Materials	Plant #4	Muskingum	sand—building gravel—bituminous concrete	Mum-786
	Raleigh Spradlin Gravel Co.	Salt Creek Materials	Madison	sand—unspecified gravel—unspecified	Mum-216
	Sturm & Dillard Co.	John N. Bowers Pit	Circleville	sand—building, road construction, resurfacing gravel—building, road construction, resurfacing	Pky-2
Pickaway	Chattin Concrete Standard Slag Co.	Sturm & Dillard Co.	Circleville	sand—unspecified gravel—unspecified	Pky-1
Pike	Beck Sand & Gravel, Inc.	Chattin Concrete	Seal	sand—portland cement concrete, building gravel—building, filtration	Pke-23
	Brimfield Sand & Gravel	Cutlip	Scioto	sand—portland cement concrete, bituminous concrete, building, other gravel—building, portland cement concrete, road construction, resurfacing, other	Pke-24
Portage	Beck Sand & Gravel, Inc.	Beck Sand & Gravel, Inc.	Shalersville	sand—unspecified gravel—unspecified	Pe-50
	Karl Brugmann Sand & Gravel	Brimfield Sand & Gravel	Brimfield	sand—fill gravel—fill	Pe-80
	Oscar Brugmann Sand & Gravel, Inc.	Karl Brugmann Sand & Gravel	Shalersville	sand—building gravel—building, unspecified	Pe-15
	Copley Sand & Gravel Co.	Oscar Brugmann Sand & Gravel, Inc.	Shalersville	sand—building, unspecified gravel—building, unspecified	Pe-9
Portage	R. A. Cruise Sand & Gravel, Inc.	Copley Sand & Gravel Co.	City of Aurora	sand—unspecified gravel—unspecified	Pe-84
	Hilltop Aggregate, Inc.	R. A. Cruise Sand & Gravel, Inc.	Ravenna	sand—road construction, resurfacing, unspecified gravel—building, unspecified	Pe-45
	Warner L. Hughes, Inc. Hugo Sand Co.	Hilltop Aggregate, Inc.	Suffield	sand—portland cement concrete, unspecified gravel—unspecified	Pe-56
	Jefferson Materials Co.	Hughes Pit Hugo Sand Co.	Suffield Franklin	sand—fill gravel—building, road construction, resurfacing, unspecified	Pe-76 Pe-10
	Karg Sand & Gravel Co.	Howitt Plant	Streetsboro	sand—building, road construction, resurfacing, filtration gravel—building, road construction, resurfacing, filtration, other	Pe-63
	Lakeside Sand & Gravel Co.	Karg Sand & Gravel Co.	Brimfield	sand—other gravel—other	Pe-77
	Lucky Sand & Gravel Co.	Lakeside Sand & Gravel	Shalersville	sand—portland cement concrete gravel—building	Pe-40
	Miller Sand & Gravel Co.	Lucky Sand & Gravel Co.	Mantua	sand—portland cement concrete, building, other gravel—building, road construction, resurfacing, filtration, other	Pe-75
	Northern Ohio Materials, Inc.	Miller Sand & Gravel	Windham	sand—building, other gravel—building, unspecified	Pe-39
	The Schloss Paving Co.	Northern Ohio Materials, Inc.	Streetsboro	sand—building, road construction, resurfacing, fill gravel—building	Pe-85
	Sober Sand & Gravel Co.	Schloss Paving Co.	Mantua	sand—bituminous concrete gravel—bituminous concrete	Pe-60
		Sober Sand & Gravel Co.	Rootstown	sand—unspecified	Pe-18

1984 OHIO DIRECTORY OF REPORTING SAND AND GRAVEL MINING OPERATORS, BY COUNTY—Continued

County	Name and address of operator	Name of pit	Township	Type and principal use	State mine number
Portage (cont.)	Solon Excavators Sand & Gravel, Inc. Standard Slag Co.	Solon Excavators Sand & Gravel, Inc. Shalersville	Shalersville	sand—building gravel—building sand—portland cement concrete, bituminous concrete, fill gravel—building, portland cement concrete, bituminous concrete, road construction, resurfacing	Pe-36
	Twin Lakes Sand, Inc.	Shalersville	Shalersville	sand—road construction, resurfacing	Pe-68
		Streetsboro	Streetsboro	gravel—road construction, resurfacing	Pe-59
	Wysong Gravel Co.	Camden Plant	Somers	sand—road construction, resurfacing gravel—road construction, resurfacing	Pe-67
Preble				sand—portland cement concrete, bituminous concrete, building, road construction, resurfacing gravel—building, portland cement concrete, bituminous concrete, road construction, resurfacing	Pre-4
		West Alexandria Plant	Twin	sand—portland cement concrete, bituminous concrete, building, road construction, resurfacing	Pre-6
Richland	D. H. Bowman & Sons, Inc.	D. H. Bowman & Sons, Inc.	Jefferson	sand—bituminous concrete, road construction, resurfacing, fill gravel—building, bituminous concrete, road construction, resurfacing, other	Rd-4
	John L. Garber Materials, Inc.	J. L. Garber Materials, Inc.	Troy	sand—building gravel—building	Rd-14
	Mohican Sand & Gravel, Inc.	Lucas Pit & Mill	Monroe	sand—building, road construction, resurfacing	Rd-5
	J. J. Scott Co.	Ganges Gravel	Cass	gravel—building, road construction, resurfacing, other	Rd-18
Ross	Brewer & Brewer Materials, Inc.	Brewer & Brewer Mtls., Inc. N-3	Union	sand—portland cement concrete, bituminous concrete, building, other	Rs-19
	C. D. Materials	Plant 3 Pit	Green	gravel—building, bituminous concrete, road construction, resurfacing, filtration, other	Rs-8
	Chief Cornstalk Sand & Gravel, Inc.	Chief Cornstalk #1	Springfield	sand—road construction, resurfacing	Rs-CC ⁶
	Lyle Fuller Miami Gravel Co.	Fuller Gravel Muskingum River Gravel Plant #7	Concord Liberty	sand—fill gravel—building gravel—building sand—bituminous concrete, building, road construction, resurfacing	Rs-21 Rs-4
	Morrison Gravel Co. R & R Aggregates, Inc.	Morrison Sand & Gravel R & R Aggregates, Inc.	Franklin Huntington	gravel—building, bituminous concrete, road construction, resurfacing gravel—other sand—portland cement concrete, building	Rs-12 Rs-23
Sandusky	Whitehall Farms, Inc.	Whitehall Farms	Green Creek	sand—fill	Sy-18
Scioto	Monroe Cunningham	Cunningham Pit	Porter	sand—unspecified gravel—unspecified	So-83
	Standard Slag Co.	Haverhill	Green	sand—portland cement concrete, bituminous concrete gravel—building, bituminous concrete, road construction, resurfacing, other	So-79
Seneca	Wright Sand	Wright Sand Pit	Eden	sand—unspecified gravel—unspecified	Sa-11
Shelby	Ernst Gravel Co.	Ernst Gravel Co.	Loramie, Washington	sand—unspecified	Shy-1
	Fleckenstein Farm Gravel Pit	Fleckenstein Farm Gravel Pit	McLean	gravel—unspecified sand—unspecified gravel—fill	Shy-12
	Miami River Stone Co.	Miami River Stone Co.	Orange	sand—road construction, resurfacing gravel—bituminous concrete	Shy-17
	Sidney Sand & Gravel Co.	Milligan & Milligan Washington Twp. Pit	Washington	sand—unspecified gravel—unspecified	Shy-13
	Spring Creek Corp.	Pence Drag Strip Jones Deposit	Washington Washington	gravel—unspecified sand—portland cement concrete, bituminous concrete gravel—portland cement concrete, bituminous concrete sand—portland cement concrete gravel—portland cement concrete	Shy-11 Shy-18

Stark	Beaver Excavating, Inc. Canton Aggregate	Stone Products, Inc.-Varley Stone Products, Inc.-Fulton Canton Aggregate	Perry Jackson Plain	gravel—road construction, resurfacing gravel—road construction, resurfacing sand—portland cement concrete, bituminous concrete, building gravel—building, portland cement concrete, bituminous concrete	Sk-190 Sk-207 Sk-681
		Canton Aggregate	Jackson	sand—portland cement concrete, bituminous concrete, building gravel—building, portland cement concrete, bituminous concrete	Sk-689
	A. J. Diana Sotis, Inc.	Neidert Pit	Lawrence	sand—building gravel—building sand—portland cement concrete, building, filtration gravel—building, portland cement concrete, filtration	Sk-AJD ^a Sk-182
	Hartville Sand & Gravel, Inc.	Hartville Sand & Gravel	Lake	sand—portland cement concrete, bituminous concrete, building gravel—building, portland cement concrete, bituminous concrete, road construction, resurfacing, other	Sk-206
	Heiser Sand & Gravel	Heiser Sand & Gravel	Plain	sand—building, fill gravel—road construction, resurfacing sand—bituminous concrete, building, road construction, resurfacing	Sk-688 Sk-607
	Massillon Washed Gravel Co.	Massillon Washed Gravel Co.	Jackson	gravel—building, bituminous concrete, road construction, resurfacing	
			Bethlehem	sand—bituminous concrete, building, road construction, resurfacing, other	
	Oster Sand & Gravel, Inc.	Oster Sand & Gravel, Inc.	Perry	gravel—building, bituminous concrete, road construction, resurfacing, other	Sk-165
	Ross Aggregates, Inc.	Spies Property	Jackson	gravel—road construction, resurfacing gravel—road construction, resurfacing	Sk-210
	Flesher Sand & Gravel	Flesher Sand & Gravel	Norton	sand—foundry, building, road construction, resurfacing, other	St-18
Summit	Hammond Bros. Jackie Lee Enterprises, Inc.	Hammond Bros. Minor Rd. Plant	Copley Copley	gravel—building sand—road construction, resurfacing	St-39 ⁷ St-39 ⁷
	H. M. Miller Construction Co.	Krumroy Pit	Springfield	gravel—road construction, resurfacing	St-46
	Northern Ohio Materials, Inc.	Northern Ohio Materials, Inc.	Hudson	sand—fill gravel—fill gravel—building, road construction, resurfacing, fill	St-41
	Portage Lakes Sand & Gravel Co.	Portage Lakes Sand & Gravel Co. Plant #4	Green	gravel—building sand—building	St-33
	Riverside Sand & Gravel Co., Inc.	Riverside Sand & Gravel (Acken)	Stow	gravel—building, road construction, resurfacing	St-24
	Rubber City Sand & Gravel Co.	Knight Plant	Green	gravel—building, road construction, resurfacing	St-9
	Twin Lakes Sand, Inc.	Barberton	Coventry	sand—building gravel—road construction, resurfacing	St-44
		Arlington	Green	gravel—road construction, resurfacing	St-32
	Kinsman Sand & Gravel Co.	Kinsman Sand & Gravel Co.	Kinsman	sand—bituminous concrete, building, fill gravel—road construction, resurfacing, fill	TL-9 ^a
	Oster Sand & Gravel, Inc.	Oster Sand & Gravel, Inc.	Lawrence	sand—bituminous concrete, building, road construction, resurfacing, fill gravel—building, bituminous concrete, road construction, resurfacing, other	Ts-1852
Trumbull	Soehnlens Sand & Gravel Co.	Soehnlens Bros. Sand & Gravel	Wayne	sand—building, road construction, resurfacing gravel—building, road construction, resurfacing	Ts-1826
	Spring Industries	Sandyville Pit Midvale Pit	Sandy Goshen	gravel—building sand—portland cement concrete, bituminous concrete, building, road construction, resurfacing, other	Ts-515 Ts-1771
				gravel—building, portland cement concrete, bituminous concrete, road construction, resurfacing	
	Stewart & Reichman, Inc.	County Line Plant Stewart & Reichman, Inc.	Franklin Warwick	gravel—portland cement concrete sand—building, road construction, resurfacing	Ts-1788 Ts-111
	Stocker Sand & Gravel Co.	Stocker Sand & Gravel Co.	Clay	gravel—portland cement concrete, building, road construction, resurfacing gravel—building, portland cement concrete, road construction, resurfacing	Ts-69
Tuscarawas					
Trumbull					
Tuscarawas					

^aNo mine number has been assigned by the Division of Mines.⁷St-39 operated by Hammond Bros. for 1st and 2nd quarters of 1984, and by Jackie Lee Enterprises for 3rd and 4th quarters of 1984.⁸See also Ashland County.

1984 OHIO DIRECTORY OF REPORTING SAND AND GRAVEL MINING OPERATORS, BY COUNTY—Continued

County	Name and address of operator	Name of pit	Township	Type and principal use	State mine number
Tuscarawas (cont) Warren	Stocker Sand & Gravel Co. (cont)	Stocker Sand & Gravel Co.	Clay	sand—building, road construction, resurfacing gravel—road construction, resurfacing	Ts-125
	American Aggregates Corp.	Franklin #417	Franklin	sand—road construction, resurfacing	Wan-38
Washington	Bellbrook Gravel Co.	Bellbrook Gravel Co.	Wayne	gravel—road construction, resurfacing sand—unspecified	Wan-24
	Clark Gravel Co. Dravo Corp.	J. L. Clark Crushed Stone South Lebanon-Oeder	Union Union	gravel—unspecified gravel—road construction, resurfacing, other sand—road construction, resurfacing	Wan-22 Wan-41
	Embro, Inc.	Embro, Inc.	Franklin	gravel—road construction, resurfacing sand—portland cement concrete, other	Wan-7
	L & I Trucking & Construction, Inc.	L & I Trucking & Construction, Inc.	Hamilton	gravel—unspecified	Wan-8
	Watson Gravel, Inc.	Mason Pit	Union	gravel—unspecified sand—building, road construction, resurfacing, other gravel—building, road construction, resurfacing, other	Wan-10
	Beverly Slag Co. Briggs Sand & Gravel, Inc.	Devola Pit Briggs Sand & Gravel, Inc.	Muskingum Warren	gravel—unspecified sand—building gravel—road construction, resurfacing	Wn-55 Wn-508
	Chesterhill Stone Co.	Lowell Plant #3	Adams	sand—unspecified	Wn-56
	Muskingum River Gravel Co.	Plant #2	Grandview	gravel—unspecified sand—bituminous concrete	Wn-38
		Plant #5	Muskingum	gravel—bituminous concrete sand—bituminous concrete	Wn-52
	Trout Sand & Gravel Co.	Trout Sand & Gravel Co.	Warren	sand—building	Wn-510
Wayne	Union Slag Corp.	Union Slag Plant #3	Muskingum	gravel—building sand—bituminous concrete, road construction, resurfacing, other	Wn-43
		Union Slag Plant #2	Muskingum	gravel—bituminous concrete, road construction, resurfacing sand—bituminous concrete, road construction, resurfacing gravel—bituminous concrete, road construction, resurfacing	Wn-44
	Prairie Lane Sand & Gravel Co.	Prairie Lane Sand & Gravel Co.	Franklin	sand—unspecified	We-11
	Rupp Construction, Inc.	Rupp	Baughman	gravel—unspecified sand—portland cement concrete, bituminous concrete, building gravel—building, portland cement concrete, bituminous concrete	We-7
	Zollinger Sand & Gravel Co.	Zollinger Sand & Gravel Co.	Chippewa	sand—unspecified gravel—unspecified	We-15
Williams	Maumee Stone Co. Weber Sand & Gravel, Inc.	South Montpelier Weber Sand & Gravel, Inc.	Superior St. Joseph	sand—road construction, resurfacing sand—portland cement concrete, building, filtration gravel—building, other	Ws-6 Ws-11
Wyandot	Amert Gravel Co.	Amert Gravel Co.	Eden	sand—building, road construction, resurfacing, other gravel—building, road construction, resurfacing, filtration, other	Wt-4
	H & M Sand & Gravel Co.	H & M Sand & Gravel Co.	Eden	sand—portland cement concrete, bituminous concrete, building, filtration	Wt-5
		H & M Sand & Gravel Co.	Eden	gravel—building, filtration, fill sand—portland cement concrete, bituminous concrete, building, filtration	Wt-15
	Kirbys Sand & Gravel, Inc.	Kirbys Sand & Gravel	Eden	gravel—building, filtration, fill sand—building, filtration gravel—building, portland cement concrete, filtration	Wt-17

1984 OHIO DIRECTORY OF REPORTING SANDSTONE-MINE OPERATORS, BY COUNTY

County	Name of operator	Name of quarry	Township	Geological unit	Type and principal use	State mine number
Carroll	Conotton Valley Quarries Co.	Conotton Valley Quarry	Lee		dimension stone—finished	Cl-102
Columbiana	Adams Excavating Co. Beaver Creek Sand & Gravel, Inc.	Don Adams Beaver Creek Sand & Gravel, Inc.	Elkrun Salem		crushed or broken stone—riprap crushed or broken stone—road base	Ca-845 Ca-855
Coshocton	Briar Hill Stone Co.	Quarry #26 Quarry #3 Quarry #32 Quarry #24 Quarry #51 Quarry #15	Monroe Tiverton Monroe Monroe Tiverton Jefferson	Massillon (Pennsylvanian) Massillon (Pennsylvanian) Massillon (Pennsylvanian) Massillon (Pennsylvanian) Massillon (Pennsylvanian) Massillon (Pennsylvanian)	dimension stone—rough architectural dimension stone—refractory, rough architectural dimension stone—rough architectural dimension stone—rough architectural dimension stone—rough architectural dimension stone—rough architectural	Cn-13 Cn-659 Cn-686 Cn-692 Cn-771 Cn-788
Cuyahoga	Boyas Excavating, Inc.	Boyas' Valley View Quarry	Independence	Bedford (Mississippian)	crushed or broken stone—aggregate	Cya-BE ¹
Erie	Cleveland Quarries Co. Harris Excavating Co.	Birmingham Quarry Harris Excavating Co.	Florence Berlin	Berea (Mississippian) Berea (Mississippian)	dimension stone—rubble, finished, curbing, flagging crushed or broken stone—riprap	Ee-21 Ee-15
Geauga	Walter C. Best, Inc.	Best Sand Corp.	Munson	Sharon conglomerate (Pennsylvanian)	crushed or broken stone—foundry sand, fracking sand, other	Gea-3
		Best Silica	Bainbridge	Sharon conglomerate (Pennsylvanian)	dimension stone—rough construction, other	
	Set Silica Sand, Inc.	Set Silica Sand, Inc.	Bainbridge	Sharon conglomerate (Pennsylvanian)	crushed or broken stone—foundry sand, aggregate, other	Gea-36 ²
	R. W. Sidley, Inc.	R. W. Sidley, Inc. Sand- stone Quarry	Thompson	Sharon conglomerate (Pennsylvanian)	dimension stone—decorative	Gea-36 ²
		Quarry #31	Knox	Sharon conglomerate (Pennsylvanian)	crushed or broken stone—metallurgical pebble, refractory, aggregate, engine sand	Gea-1
Holmes	Briar Hill Stone Co.	Mesenburg Bros., Inc.	Townsend	Massillon (Pennsylvanian)	dimension stone—rough architectural	Hs-49
Huron	Mesenburg Bros., Inc.	Quarry #6	Butler	Berea (Mississippian)	crushed or broken stone—riprap	Hrn-8
Knox	Briar Hill Stone Co. Central Silica Co.	Millwood Sand Division	Union	Massillon (Pennsylvanian) Black Hand (Mississippian)	dimension stone—rough architectural crushed or broken stone—glass sand, silica flour, foundry sand, other	Kx-12 Kx-1
Lorain	Cleveland Quarries Co.	Amherst Quarries	Amherst	Berea (Mississippian)	crushed or broken stone—aggregate dimension stone—finished, rubble, flagging, curbing, grind- stones	Ln-3
Mahoning	Gwin Contracting Co.	Gwin Contracting Co.	Milton	Sharon sandstone (Pennsylvanian)	crushed or broken stone—unspecified	Mg-62
Perry	Central Silica Co.	Central Silica Co.	Hopewell	Massillon (Pennsylvanian)	crushed or broken stone—glass sand, silica flour, foundry sand, other	Py-202
Ross	Southern Silica, Inc.	Southern Silica, Inc.	Jefferson	Sharon conglomerate (Pennsylvanian)	crushed or broken stone—glass sand, foundry sand, engine sand, other	Rs-16
Scioto	Waller Bros. Stone Co.	Inskeep Quarry Crabtree Quarry Miller Quarry	Rush Morgan Morgan	Buena Vista (Mississippian) Buena Vista (Mississippian)	dimension stone—rough construction dimension stone—rough construction dimension stone—rough construction	So-48 So-76 So-82
Trumbull	Hard Rocks, Inc.	Hard Rocks, Inc.	Kinsman		crushed or broken stone—aggregate	Tl-13
Tuscarawas	Belden Brick Co. Pennsylvania Glass Sand Corp.	Moomaw Pit Coxey Works	Sugar Creek Wayne	Tionesta (Pennsylvanian) Massillon (Pennsylvanian)	crushed or broken stone—brick facing crushed or broken stone—foundry sand, fire and furnace sand	Ts-1517 Ts-1660

¹No mine number has been assigned by the Division of Mines.²Gea-36 operated 1st quarter by Set Silica Sand, Inc.; operated 2nd, 3rd, and 4th quarters by Walter C. Best, Inc.

1984 OHIO DIRECTORY OF REPORTING CLAY-MINE OPERATORS, BY COUNTY

County	Name of operator	Name of mine	Township	Geological unit	Principal use	State mine number
Auglaize	Sandkuhl Tile Co.	Sandkuhl Tile Co.	Salem	Pleistocene glacial clay	common clay products	Ae-7
Columbiana	Ferris Coal Co., Inc.	Negley Pit	Middleton	Lower Kittanning (Pennsylvanian)	common clay products	Ca-505
Coshocton	General Clay Products Corp.	Drescher Pit	Crawford	Lower Kittanning (Pennsylvanian)	common clay products	Cn-787
Greene	Southwestern Portland Cement Co.	Southwestern Portland Cement Co.	Bath	till	cement manufacture, other	Ge-8
Hocking	General Clay Products Corp.	General Clay Products Corp.	Falls Gore	No. 5 fire clay (Pennsylvanian)	vitrified products	Hg-205
Holmes	Clark Clay Co.	Clark Clay Co.	Hardy	Putnam Hill (Pennsylvanian)	common clay products	Hs-56
	Holmes Limestone Co.	Holmes 241 Plant	Hardy	Brookville (Pennsylvanian)	common clay products	Hs-67
Jackson	Cedar Heights Clay Co.	Cedar Heights	Madison	No. 5 clay (Pennsylvanian)	refractories	Jkn-1001
	Waterloo Coal Co., Inc.	Cedar Heights	Madison	No. 5 clay (Pennsylvanian)	common clay products	Jkn-367
Lawrence	Brohard Mining and Development, Inc.	Zoar	Bloomfield, Madison	Kittanning (Pennsylvanian)	common clay products	Le-406
		Brohard Mining and Development, Inc.	Elizabeth		refractories	Le-BMD ¹
Mahoning	SME Bessemer, Inc.	Quarry #8	Elizabeth		refractories	Mg-608
Medina	General Clay Products Corp.	General Clay Products Corp.	Poland	Vanport (Pennsylvanian)	cement manufacture	Ma-6
Muskingum	Bowerston Shale Co.	Frazesburg	Wadsworth		common clay products	Mum-776
	Hammer Clay Co., Inc.	Hammer Clay Co., Inc.	Jackson	Flint Ridge & Middle Mercer (Pennsylvanian)	vitrified products	Mum-848
Paulding	General Portland, Inc.	Paulding Quarry	Newton	Detroit River & upper Dundee (Devonian)	cement manufacture	Pg-1
Perry	Dennis Clay Co.	Cannon Mine	Crane	No. 5 clay, No. 6 top clay (Pennsylvanian)	common clay products	Py-296
Putnam	Glandorf Tile Co.	Glandorf Tile Co.	Harrison		common clay products	Pm-7
	Miller Bros. Clay Works, Inc.	Miller Bros. Clay Works, Inc.	Monroe		common clay products	Pm-9
Scioto	McCoy Clay Co.	McCoy Clay Co.	Madison		refractories	So-94
Stark	East Ohio Limestone Co.	East Ohio Limestone Co.	Lake		common clay products	Sk-663
	Kohl Industries	Black Hawk Mine	Bethlehem, Pike	Brookville, Lower Kittanning (Pennsylvanian)	refractories	Sk-217
	Statewide Landfill Co.	Statewide Landfill Co.	Canton	Lower Kittanning (Pennsylvanian)	unspecified	Sk-219
Tuscarawas	Belden Brick Co.	Wallick Pit	Franklin, Wayne	Brookville (Pennsylvanian)	common clay products	Ts-1841
		Moomaw Pit	Sugar Creek	Brookville (Pennsylvanian)	common clay products	Ts-1517
		Finger-Belden Pit	Sugar Creek	Brookville, Lower Kittanning (Pennsylvanian)	common clay products	Ts-1646
		Shanesville	Sugar Creek	Brookville (Pennsylvanian)	common clay products	Ts-1939
	Eberhart Coal, Inc.	Eberhart Hott Strip	Dover	Lower Kittanning (Pennsylvanian)	refractories	Ts-1620
	L & M Minerals, Inc.	Luitert	Mill		common clay products	Ts-1914
		Evans	Rush		common clay products	Ts-1884
	Stone Creek Brick Co.	Stone Creek Brick Co. Clay Mine	Jefferson		vitrified products	Ts-1557
	Sugarcreek Clay and Limestone, Inc.	Sugarcreek Clay and Limestone, Inc.	Sugar Creek		unspecified	Ts-1928
	Zoar Mining Co.	Zoar Mining Co.	Sandy		common clay products	Ts-540
Wyandot	Claycraft Co.	Claycraft Plant #1 Clay Pit	Crane	alluvial clay	common clay products	Wt-7

¹No mine number has been assigned by the Division of Mines.

1984 OHIO DIRECTORY OF REPORTING SHALE-MINE OPERATORS, BY COUNTY

County	Name of operator	Name of mine	Township	Geological unit	Principal use	State mine number
Columbiana	Summitville Tiles, Inc.	Summitville Tiles, Inc.	Franklin	Lower Kittanning (Pennsylvanian)	common clay products	Ca-205
Coshocton	General Clay Products Corp.	Drescher Pit	Crawford	Chagrin (Devonian)	common clay products	Cn-787
Cuyahoga	Hydraulic Press Brick Co.	Hydraulic Press Brick Co.	City of Independence	Bedford (Mississippian)	lightweight aggregate	Cya-19
Franklin	Claycraft Co.	Claycraft Plant #4 & #5 Shale Pit	Jefferson	Conemaugh (Pennsylvanian)	common clay products, landfill cover	Fn-1
Harrison	Bowerston Shale Co.	Bowerston	Monroe	No. 5 fire clay (Pennsylvanian)	vitrified products	Hn-152
Hocking	General Clay Products Corp.	General Clay Products Corp.	Falls Gore	Lower Kittanning (Pennsylvanian)	vitrified products	Hg-205
Holmes	General Clay Products Corp.	Troyer Pit	Clark	Vanport (Pennsylvanian)	common clay products	Hs-77
Lawrence	Lone Star-Marquette	Bear Run	Decatur	Logan (Mississippian)	cement manufacture	Le-308
Licking	Bowerston Shale Co.	Hanover	Hanover	Vanport (Pennsylvanian)	vitrified products	Lg-501
Mahoning	SME Bessemer, Inc.	Quarry #8	Poland	Bedford (Mississippian)	cement manufacture	Mg-608
Marion	Glen-Gery Corp.	Glen-Gery Corp.	Tully	Maxville (Mississippian)	common clay products	Mn-7
Medina	General Clay Products Corp.	General Clay Products Corp.	Wadsworth	Brookville & Lower Kittanning (Pennsylvanian)	common clay products	Ma-6
Muskingum	Columbia Portland Cement Corp.	Lyle Quarry	Newton	Strasburg (Pennsylvanian)	cement manufacture	Mum-24
Stark	Kohl Industries Romany Ceramics, Inc.	Black Hawk Mine Romany Ceramics, Inc.	Bethlehem, Pike Pike	Brookville & Tionesta (Pennsylvanian)	unspecified glazed ware	Sk-217 Sk-170
Tuscarawas	Belden Brick Co.	Wallick Pit Moomaw Pit Finzer-Belden Pit Shanesville Luikert Evans	Franklin, Wayne Sugar Creek Sugar Creek Sugar Creek Mill Rush	Brookville & Tionesta (Pennsylvanian)	common clay products	Ts-1841 Ts-1517 Ts-1646 Ts-1939 Ts-1914 Ts-1884 Ts-1558 Ts-1928 Ts-538
	L & M Minerals, Inc.	Stone Creek Brick Co. Shale Mine Sugar Creek Clay and Limestone, Inc. Zoar Mining Co.	Jefferson Sugar Creek Sandy	Brookville & Tionesta (Pennsylvanian)	common clay products	

1984 OHIO DIRECTORY OF REPORTING GYPSUM-MINE OPERATORS

County	Name of operator	Name of mine	Township	Geological unit	State mine number
Ottawa	Celotex Corp.	American No. 2	Portage	Silurian	Oa-2

1984 OHIO DIRECTORY OF REPORTING SALT-MINE AND SALT-BRINING-PLANT OPERATORS, BY COUNTY

County	Name of operator	Name of mine	Township	Geological unit and product	State mine number
Cuyahoga	International Salt Co.	Cleveland Mine	City of Cleveland	Salina (Silurian)—rock salt	Cya-30
Lake	Morton Thiokol, Inc.	Fairport Mine	Painesville	Salina (Silurian)—rock salt	Lke-6
Licking	R. H. Penick	Penick	Newark	"Newburg" (Silurian)—natural brine	Lg-45
Summit	Diamond Crystal Salt Co.	Diamond Crystal Salt Co.	Coventry	Tymochtee (Silurian)—artificial brine	St-9127
Wayne	Morton Thiokol, Inc.	Morton Salt Well Field	Milton	Salina (Silurian)—artificial brine	We-9129

1984 OHIO DIRECTORY OF REPORTING PEAT-MINE OPERATORS, BY COUNTY

County	Name of operator	Name of mine	Township	Type and principal use	State mine number
Champaign	Sphagnum Moss Peat Farm	Sphagnum Moss Peat Farm	Harrison	humus—live-bait preservative mulch	Cpn-9
Logan	Weaver's Peat Co.	Weaver's Peat Co.	Liberty	mulch	Lgn-33
Mahoning	Beaver Peat Products Co.	Beaver Peat Products Co.	Goshen	mulch	Mg-609
Williams	Lingvai Peat Co.	Lingvai Peat Pit	Center	mulch	Ws-17
Wyandot	Kalo, Inc.	Kalo, Inc. Humus Plant	Crawford	humus—legume inoculation	Wt-14

